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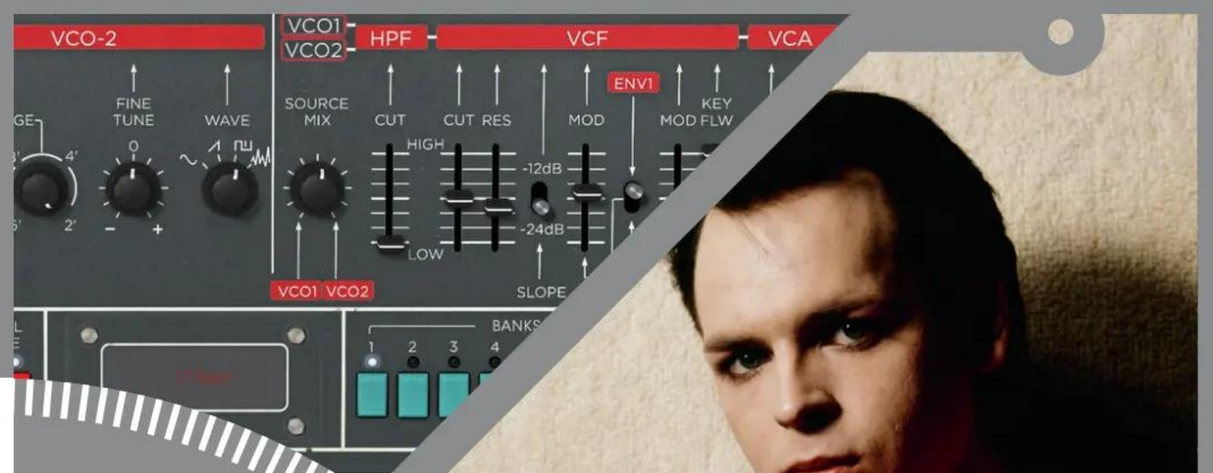
MUSIC PRODUCER'S GUIDE TO ELECTRONIC MUSIC MASTERCLASS

THE HISTORY, GEAR, PIONEERS AND TECHNIQUES



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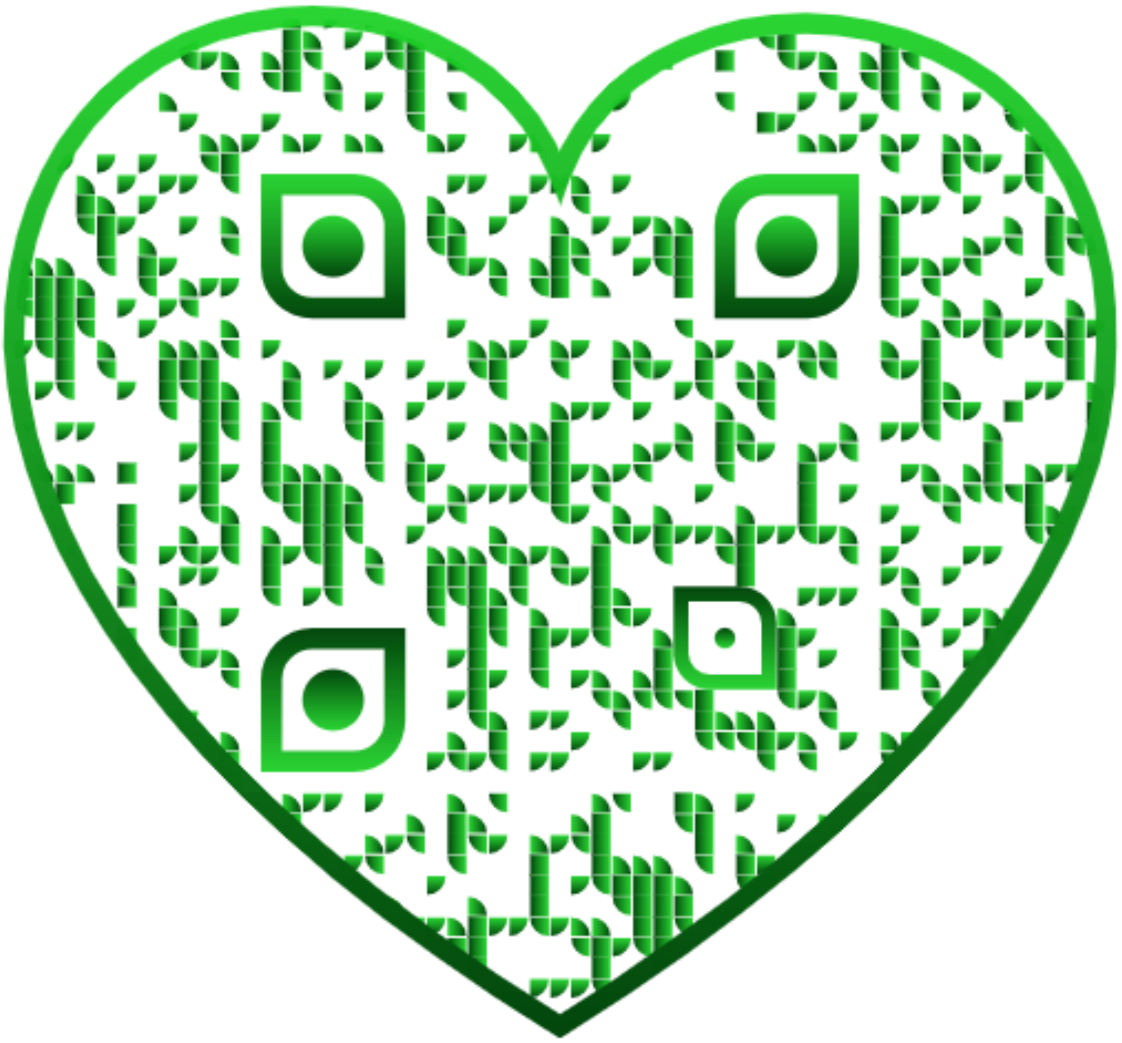

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MUSIC PRODUCER'S GUIDE TO ELECTRONIC

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Welcome to the *Music Producer's Guide to Electronic*, your guide to five decades of Electronic Music, where we speak to the pioneers, examine the history and look in detail at many of the production techniques used within this most incredible of musical genres.

Electronic Music is a vast subject to cover whichever way you look at it, so we've taken the logical approach to bring you the highlights, detail and the techniques in chronological order: from '70s synth sequences right up to huge, 21st-century basslines. However, the history of the genre goes back many hundreds of years, which we attempt to encapsulate in a feature starting on p8.

As we'll see, Electronic Music's journey has been as varied and fascinating as the technology behind it; indeed the music and the technology have influenced one another so much that you can't really talk about one without the other, so expect us to delve deeply into the rich, technical side of music production as we traverse its history. We are focussing on the synthesizers behind the sound and detail these machines, from analogue modular monsters to sleek cutting-edge software. And don't worry if you are not equipped with the latest music production gear, as we are giving you many of the software tools you need, free with this guide. See p6 for more details.

Of course Electronic Music isn't really about one musical genre but many (many) varied sub genres. You could sum it up as music produced by technology, yet even that definition covers a multitude of styles and bpms, so we have several step-by-step workshops to help your music production skills progress within ten genres spanning 50 years: from ambient to bassline, synth pop to synthwave.

Finally we'll guide you through some of the classic electronic sounds from the last five decades, showing you how to recreate a Kraftwerk blip here or a Daft Punk growl there, and all with the software that we give you for free.

Really, as this guide demonstrates, *all* music is now electronic in some way, shape or form, so Electronic Music is really what you make it; the focus, therefore, is on *your* music productions, in whatever style you choose. But we hope you enjoy reading about some of the cutting-edge producers and techniques used by those who have gone before you, and look forward to hearing your productions add to the rich history of Electronic Music production.

Keep tweaking.

Andy Jones

COMPUTER music Presents

MUSIC PRODUCER'S GUIDE TO ELECTRONIC

Over the last five decades, Electronic Music has grown from experimental valve tones, to a computer-generated global musical force. Here we trace its progress over those decades, talk to its innovators, and reveal how you can recreate some of the most famous genres and sounds in a rich history you can explore from **page 8**.

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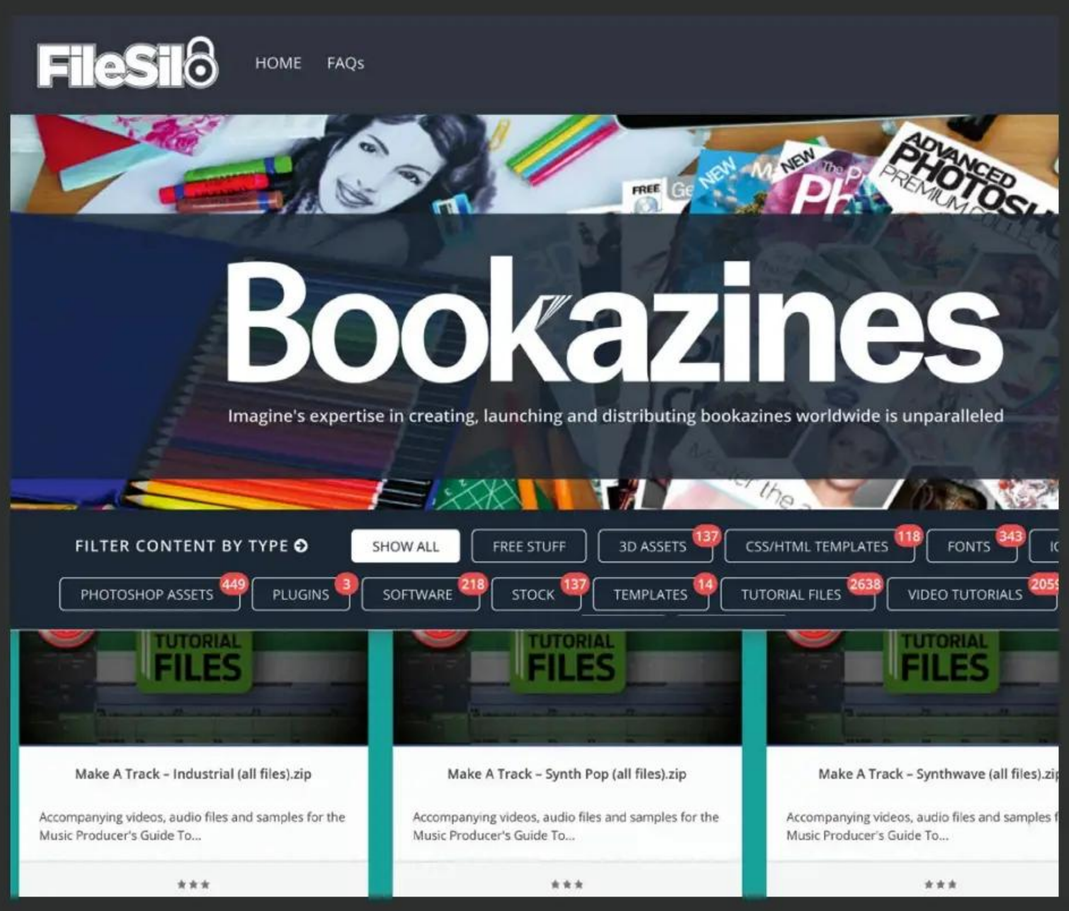
How to use this guide

Your step-by-step guide on how to make the most of this **Music Producer's Guide To Electronic**, detailing all the online videos, software and tutorial files that accompany each of our workshops, for a completely interactive learning experience!



This icon means there are extra files to help you follow a tutorial feature: project files, audio examples, etc.

There's extra video content wherever you see this icon.

> Welcome to the Music Producer's Guide To Electronic. As well as detailing the history of Electronic Music and chatting to some of the pioneers within its many and varied genres, we also have step-by-step workshops for creating music within specific genres and recreating famous synth sounds.

In order to get the best from each of these tutorials, we have produced sets of sound files and instruction videos to go with them. You can hear how your music is supposed to progress as you make your way through each workshop, and, if you run into trouble, see what you need to do on video.

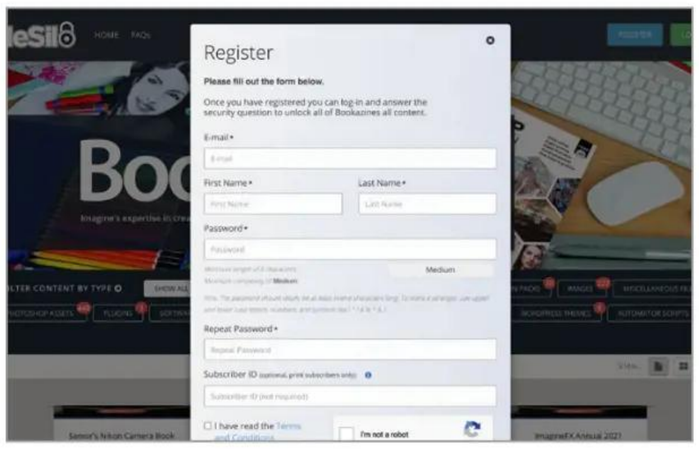
We have also included the *Computer Music* Plugin Suite, a set of over 90 instruments and effects that you can download and install for free, many of which you will need to install and run to use the workshops in this guide.

In order to access all of this additional content, please go to **filesilo.co.uk**. Once in you will be presented with audio files, videos and more, feature by feature, in the Tutorials area. We have an easy, step-by-step guide to using FileSilo on the right.

The *CM* Plugin Suite is in the Software section and comprises instruments and effects for Mac or PC. Simply download the software plugins for whichever type of computer platform you use. More detailed instructions on how to install these instruments and effects are included in our step-by-step guide to using The *CM* Plugin Suite on the opposite page. There's also a PDF giving more information on each plugin in the Software section at FileSilo.

We hope you'll enjoy creating music in the ten Electronic Music genre tutorials we have included, and also recreating the many classic synth sounds using your free plugins!

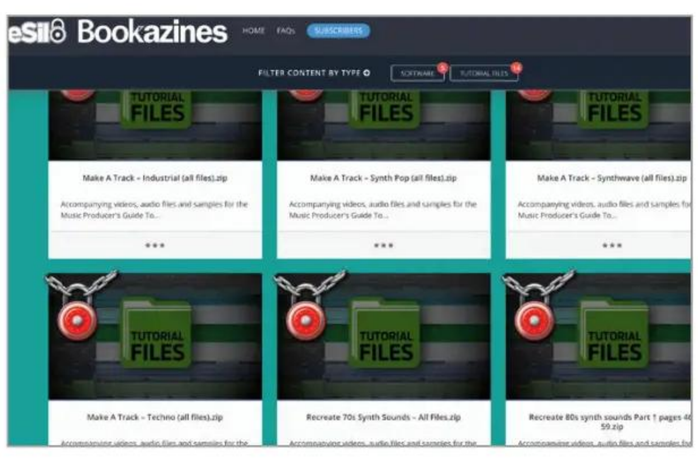
Using Filesilo



1 > Open the internet browser of your choice and go to **filesilo.co.uk.** You don't need an account to access Filesilo's content.

2 > Go to the Bookazines tab at the main FileSilo screen. Click this and you will see a list of recent bookazines we have produced including **The Music Producer's Guide To Electronic**. Click this – it will have the same image as the cover of this bookazine.

3 > Now simply go to the feature name – like Make A 70s Synth Track, Recreate 90s Synth Sounds and so on – and you will download all of the files associated with that feature. These include hands-on videos, audio files (so you can hear how the sound or song progresses) and samples that you can load in to help you produce within a genre.

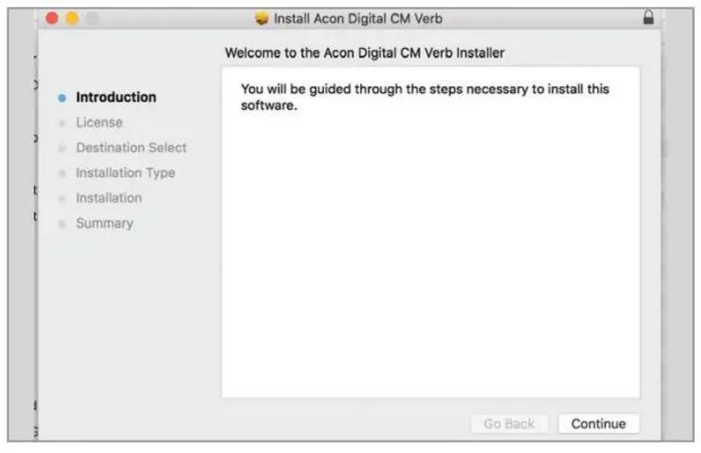


4 > Click on the link and after a few seconds the download process will begin.

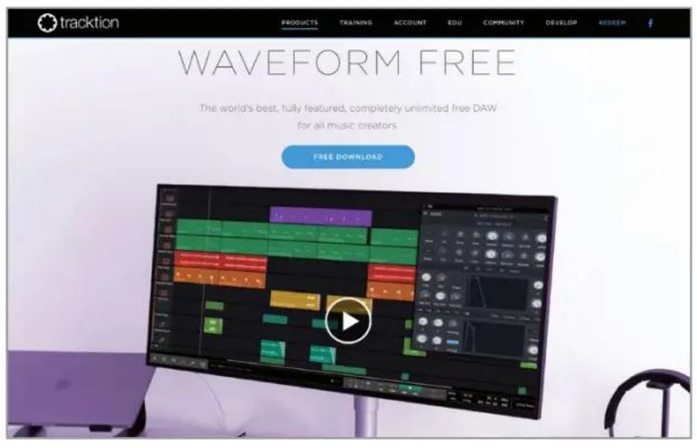
Installing plugins from the CM Plugin Suite

1 > Go to the software section at FileSilo under the Bookazines tab/**Music Producer's Guide To Electronic**.

2 > Download the plugin instruments and effects for whatever computer you use, either Mac or PC.



3 > Double click on the plugin you want to install. Your computer should run through the standard software installation routine.



4 > In order to try out our genre tutorials you will need a DAW like Apple Logic or Ableton Live. There's a great free one called Traction Waveform Free at tracktion.com. Now open your DAW.

5 > When you load up your DAW, it should pick up the new plugins you have installed. If not, you might have to restart your computer. Now, install the plugin from your DAW plugin folder onto whatever mixer channel you want to use and you are ready to try our tutorials!

The *Computer Music* Plugin Suite is a set of over 90 instruments and effects that you can download and install for free!

THE HISTORY OF ELECTRONIC MUSIC.

From found sound and valve-based machines through to EDM and iPad synths, Electronic Music's journey has been incredible, complicated and perhaps a lot longer than you might think. Here we break down its history into component parts – ironically, rather like a modular synth – and discover its rather 'shocking' beginnings...

What is Electronic Music and what is its history? Well, the answers to both of these questions are open to interpretation. The popular and somewhat easy view is that Electronic Music is synthetic or 'found' sound and that it started with the invention of the synthesiser and its use in the 60s and 70s. As much as we were tempted to start its history there, Electronic Music's inception can really be traced back further. Much further. In fact, you can track the early experimentation with sound, and the machines that were invented to manipulate it, back hundreds of years. Ok, the fun really started when people started recording and releasing the results a few decades back – not to mention making accurate records of the machines that they created – but before we get to the 60s, there's a couple of hundred years to cover (albeit briefly), including some claims to discuss, some to dismiss and some others that are just, well, shocking... in all the wrong ways.

The start?

Taking things way back, you can make the case that the beautiful-sounding Golden Dionysis was very possibly the first electrical musical instrument. It was 'built' by the Czech electrical researcher Václav Prokop Diviš in 1748, who claimed to be able to recreate string and wind sounds with it. You'll note that we say 'claimed' and 'very possibly' as other accounts of the time state that it gave its users electric shocks, so, like we say, it might be better to move to firmer historic ground, over a century later when, at the very least, some of the claims were justified and recorded.

For this, we travel forward to the end of the late 19th century and Matthias Hipp's Electromechanic Piano, which triggered sound by way of activating electric magnets with a keyboard. Even better records exist about the Telharmonium, developed at the same time by Thaddeus Cahill, an instrument not only capable of altering or indeed synthesising sound, but spreading it across the newly-created phone network. (This instrument can therefore not only claim to be the first synthesiser but also one to use an early form of the internet. Ok, maybe not.)

Meanwhile, in the late 19th century, Elisha Gray is also noted as (almost) accidentally inventing the synth oscillator while developing a telephone prototype in the late 19th century. But if you think it's a complex history in this era, just wait until the next century...

20th Century vision

Things get even more complex in the early 20th century, with a range of instruments that could and would lay claim to chunks of Electronic Music history, not least the electric organ and another couple of standout devices, notably the Helmholtz Sound Synthesiser and Theremin (see over the page). The Sound Synthesiser was not only the first instrument to claim the 'synth' name, but used overtones and even basic filtering in the creation of sounds – some of the important sonic ingredients still used today. So now we seem to have finally arrived at the dawn of Electronic Music as the artificial manipulation of sound – arguably the very definition of the genre – becomes a reality.

As we progressed through the century, there was Ivor Darreg who, in the 1930s and 40s, designed instruments called the Electronic Keyboard Oboe and Electric Keyboard Drum, which could lay claim to being the first

electric instruments specifically intended for music. And as we dig deeper, other important instruments included the 1930s Trautonium, made by Freidrich Trautwein, and then enhanced into the post-Second World War Mixturtrautonium by Oskar Sala. Using what was called a 'Sub-harmonic' technique of sound creation, these allowed you to mix, match and modulate signals with controls like envelope shapers and frequency shifters which would later become common in subtractive synths.

In the 1950s RCA and Musique Concrète (see below) helped take Electronic Music in new directions and not always intentionally. Musique Concrète created genres of music unwittingly, and RCA built a room full of electrics for fairly dodgy reasons but in doing so, eventually came up with something called the Electronic Music Synthesizer Mk1. This ended up being almost sequencer-like in its ability – you could define note timbre, volumes, envelopes and so on – but was actually intended to produce a formula for hit records, a kind of Stock Aitken And Waterman of its time.

Luckily, this initial 'auto-hit song creation' concept was dropped, but the idea of creating sound electronically was leapt upon and a Mk2 version was developed at the Columbia-Princeton Electronic Music Center, and was used to help create music like Charles Wuorinen's *Time's Encomium*, which eventually won the Pulitzer Prize for music. The concept of electronic sound synthesis was finally here, but it would take two men, Don Buchla and Robert Moog – who are now seen as the inventors of the synthesiser and the genres of music it spawned – plus further advances in electronics to finally bring it to the masses.

To the music – the 60s!

In the 1960s, music was still very much about electric guitars and rock n roll. On the more electronic side, the output was initially limited to the experimental musings of Musique Concrète artists and the RCA Synthesizer, but electronic components were starting to become smaller and much more affordable, so no longer did you require an RCA-sized room to house a supercomputer capable of creating and manipulating sound.

Professor Leon Theremin demonstrating the machine he gave his name

Getty

The Theremin

The 1920s Theremin is a unique device in electronic music making, not so much used to create sounds, but perform them. Ok, its eerie tone is a bit of a one-off, but it has claimed its part in music history – particularly in early sci-fi and Beach Boys tunes – largely down to this rather atmospheric tone and the way it is produced. A performer can alter the pitch and volume of the sound merely by moving their hand up and down and further away from the device. The story behind its invention and popularity is like something out of a film, and deserves its own book. As fascinating as it is, though, this story runs on a different course to that of the synth (almost, in fact, in a parallel dimension), although, like the synth, you can now create the sound of the Theremin in software and there are also up-to-date hardware versions, notably the Moog Theremini.

Electronic music might well have been in its infancy in the 60s, then, but it was just about to become mainstream, with a smattering of popular composers and one or two choice new synthesizer instruments.

It was Don Buchla and Robert Moog who must take the major credits here, and for the early Electronic Music outings, and be lauded as the godfathers of the modern synthesiser and the genre itself. In the 1960s they both separately developed voltage-controlled modular synth systems that, while still expensive, did manage to come within reach of some of the big musical names of the time. The Beatles, Frank Zappa and The Beach Boys all dabbled with early synthesisers, although perhaps the first pure and total electronic piece – an entire album's worth, actually – came by way of Wendy Carlos, whose *Switched-On Bach* recreated pieces by Johann Sebastian Bach by way of one of Bob Moog's modular synths. Now, we really were starting to rock the circuits.

> No longer did you require a room to house a super computer capable of creating sound...

In the late 60s, other artists were waking up to the idea of Moogs and Buchlas. Kraftwerk's first lineup, known as Organisation, and other

Musique Concrète

The concept of Musique Concrète is an important one in the history of Electronic Music production, not least because it got people thinking and composing along very different paths compared to using traditional notes, timbres and scales. Initially popularised by Pierre Schaeffer in the mid 20th century, whose work would lead to the formation of the Groupe de Recherches de Musique Concrète and Groupe de Recherches Musicales, it would attract the likes of Pierre Boulez, Pierre Henry, Karlheinz Stockhausen and Iannis Xenakis to compose works using found sound and a more constructive approach to music creation. Stockhausen and Boulez would also use principles of chance in composition, something also adopted by the likes of John Cage (who also famously flipped the whole experimental Musique Concrète philosophy on its head – or foundations – by releasing a recording of 4 minutes and 33 seconds of silence. Well, why not?).

Musique Concrète would eventually embrace technology and be inspired by it, and its influence would seep into popular music by way of Frank Zappa, The Beatles and Pink Floyd, with the chance element also famously adopted and adapted by Brian Eno with his Oblique Strategies approach to composition. Eno would go on to also take the Concrete philosophy into some of his early albums like *On Land*, leading to the term 'ambient music', which while having its roots very much in found sounds and atmospheres on these early albums, would eventually drift rather calmly and beautifully to create sub genres of chilled Electronic Music of its own.

On top of its musical influences, you can even argue that Musique Concrète goes much deeper, influencing much of the actual music technology that has sprung up since the 70s – many of the synthesis, DSP and sampling techniques owe a much bigger debt to the philosophy of Musique Concrète and its no-holds-barred approach to sound manipulation and processing.

Wendy Carlos was one of the first composers to embrace the Moog

Getty

German pre-Kraut Rock bands, were enjoying a more psychedelic phase but were now among the first people to adopt Moogs and would change the course of music history as we shifted into the 1970s.

Progress to pop

Both in the UK and the States, rock was taking a more progressive turn and soon keyboard players like Keith Emerson, Rick Wakeman and Geoff Downs became early adopters of synths, although rather than create new electronic sounds, they preferred to emulate existing ones and play long – perhaps too long – solos with them.

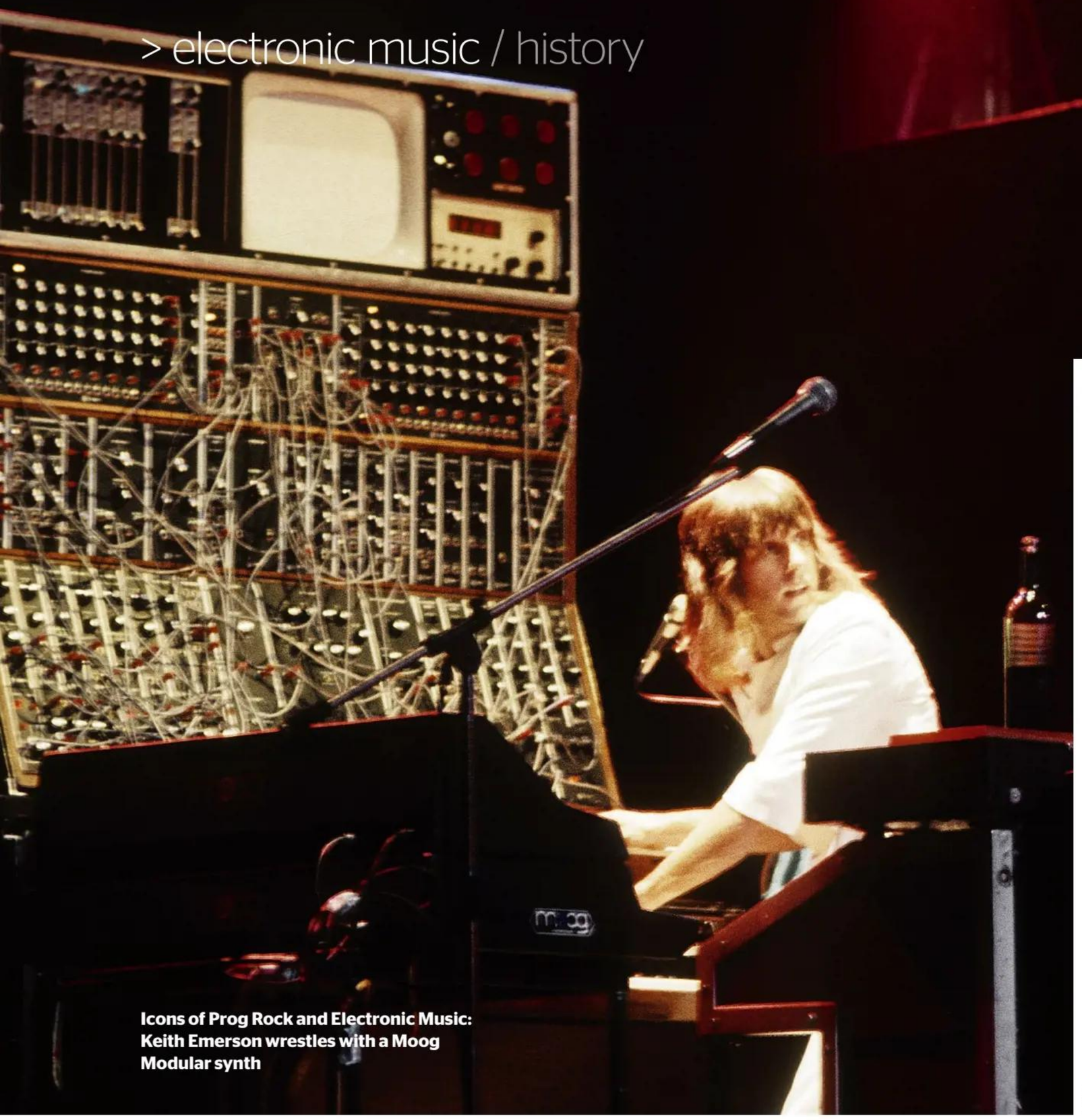
Wendy Carlos was maintaining the more classic side of Electronic Music with the theme to the notorious 1971 Kubrick film *A Clockwork Orange*, but in 1974, Kraftwerk finally got their synths together to come up with one of the defining tracks, nee albums, of the genre. *Autobahn* was its name and the title track was different on so many levels. It was almost entirely electronic – bar the odd flute and guitar – it also used vocoding, electronic percussion and, of course, synths, not to mention that it was over 22 minutes long. Perhaps only Electronic Music as a

Getty

Great Scott

Raymond Scott has been described as the 'audio version of Andy Warhol' yet has largely remained behind the scenes of Electronic Music history. He was a composer and technologist, and while he had his music licensed in cartoons, films and musicals, it's perhaps his electronic research that is his biggest legacy. He was one of the first people to come up with the idea of sequencing notes together, with a machine capable of producing tones. He invented the Electronium during the 60s, a device shrouded in mystery, but it was a combined synth and generative music producer – perhaps the first workstation, but almost certainly one of the first keyboard synths.

Scott and Bob Moog also worked together and the latter – now widely regarded as a godfather of Electronic Music – cited Scott as one of his greatest influences. Google recently launched an excellent guide to Electronic Music that gives Scott the rich space he undoubtedly deserves in its history. Check it out at *artsandculture.google.com/project/music-makers-and-machines*



Icons of Prog Rock and Electronic Music: Keith Emerson wrestles with a Moog Modular synth

Getty

musical genre could be heralded in with a covers album of Bach songs and a tune about a motorway, but as a musical force, it was here and it was here to stay.

Born in the UK

As the 70s progressed, the UK started to play an increasingly important role in the development of Electronic Music. Kraftwerk had laid down the gauntlet in Germany, for sure, but Brian Eno was already sneering at his fellow progressive rock keyboardists, experimenting with synths and creating found-sound textures in the studio. He was whacky, glam, serious and 'out there', and he would take Roxy Music into the charts, Bowie down oblique and electronic pathways with his Berlin trio of albums, and invent ambient music as we know it, and all in the space of just a few years in this decade.

Meanwhile, a little-known fact in Electronic Music history is that part of its major development in the 70s was not because of the advances in synth technology nor the outlandish creativity of its players, but actually down to the formation of a youth workshop in Sheffield called Meatwhistle. Here, not one but four influential bands (eventually) came together. Local Sheffield youths with a more creative vision were encouraged in just about every aspect of music and performance, inspiring one another and resulting in – to a greater or lesser extent – the formation of Clock DVA, Cabaret Voltaire, The Human League and Heaven 17.

The first two early League albums are now seen as two electronic masterpieces, produced by a cold dystopian version of the band that would later rule the pop charts in the 80s, but whose late 70s influence would certainly reach other artists, if not so much the record-buying public. The Cabs, meanwhile, were Sheffield's punk electronic act, putting the steel in Sheffield and, along with Clock DVA, are now seen as not only influential but laying the groundwork for major electronic labels that would come later, including Sheffield's own mighty Warp Records.

The Mk1 version of Ultravox! (note the exclamation mark) were also early adopters of the synth in the 70s, notably an ARP Odyssey, one of the classic machines of that decade. This John Foxx-led brigade of art-house students shifted from Roxy glam to rock electronica over the space of three albums and a short space of time, but it was long enough not only to propel Foxx into a solo career that would produce one of the finest pure electronic albums of all time (*Metamatic*) but also influence a certain Gary Webb. And it was this young man who, at the end of the decade, would take Electronic Music out of the theatre workshop, and onto the theatre stage.

It's popular!

Gary, now Numan, was a punk rocker in his formative years, but in easily a moment that is up there in Electronic Music history with Kraftwerk driving on a motorway for the first time, he went into a studio one day to record a punk guitar album, found a Moog synth already switched on, pressed a note and was so moved that he ditched all the guitars on his next album and replaced them with synths. Which, as they

Getty

Jean-Michel Jarre

Jean-Michel Jarre must have felt pretty alone in the 70s. While Emerson, Wakeman and Downs were playing synthesisers like be-cloaked keyboard wizards, and the League and Cabs were exploring the machines' innards like scientists, Jarre just wanted to create pure synth music, with lush melodies, chords and memorable tunes; nothing too experimental, but nothing too noodly. He wanted to use early sequencing, and he wanted to be popular without the pop, and with the album *Oxygene*, he certainly got what he wished for.

This masterpiece recording, and the *Oxygene* single (*part IV*), were his introduction into the big league. Recorded with, among other classics, a VCS3, ARP 2600, Eminent 310 and Korg Mini Pops in Jarre's kitchen(!) it stands up as one of the defining albums in Electronic Music, yet really exists in a sole category marked 'Jarre'. There's Vangelis' and Wendy Carlos' soundtracks, yes, and there's popular synth music, but then there's the enigmatic French composer stuck somewhere in between. Or, indeed, everywhere else.

He now straddles soundtracks and EDM (see his much later collaborations), he still has hit records, he can play to millions of people in ridiculously huge open-air concerts. He uses a 'laser harp' ferchristsake!

Yes Jarre, with his adoption of every technology, old, new and possibly not even invented, and his ability to dabble in just about every electronic genre is, very probably, the ultimate electronic musician. He is out of place in time, both physically and musically – possibly even the very first human synthesiser, we don't know – but he certainly deserves his own chapter (or at the very least, this box for now) in the history of Electronic Music. Actually all music, come to that. A true Electronic Music legend.

say, was nice. After he released the track *Are 'Friends' Electric?* we suddenly had synth pop as a genre, with everyone shocked into action – not least Numan himself – by this new force in music. Up until then, music that used synthesisers was novel (see Hot Butter's *Pop Corn*), soundtrack-y (see Wendy Carlos), novel and soundtrack-y (see Jean-Michel Jarre box) or Kraftwerk (see Kraftwerk). Now it was popular, very popular, and now it was British. Mostly. It had catchy melodies, it had vocals, it had songs. It was pop. Synth pop!

The pop years

Numan's bowling ball of a synth song *Are 'Friends' Electric?* would usher in the decade of synth pop, but while he took the glory, other synth bands were spitting blood. Liverpool's OMD were already producing amazing synth tunes, using crappy, cheap keyboards and a drum machine called Winston. As jealous of Numan as they have admitted they were, his success opened the door to a string of hit singles for them and many others, and they, in turn, influenced another Electronic Music icon, who deserves not one, but possibly three chapters in EM history.

Vince Clarke would hear early OMD B-Sides and realize that synths were the way to go for his formative compositions, and 40 years on, he's still amassing the machines to make them.

Until then, music that used synthesisers was novel, soundtrack-y or Kraftwerk. Now it was pop. Synth pop!

In those four decades, he managed to form Depeche Mode, Yazoo and Erasure, and managed to have the odd hit record with all three of them. Vince is probably the most iconic writer of synth pop we will ever know (*Just Can't Get Enough*, *Love To Hate You*, *Sometimes* and *Only You* earn him that accolade alone), yet is also the most unassuming.

And after launching the good ship Depeche Mode, he slipped across the gangplank before its voyage really began, leaving the captaincy (ok, we'll leave that analogy now) to Martin Gore. And where Vince can claim the top pop honours, Gore can certainly claim the, well, gore. His more doom-laden, yet massively uplifting blend of songwriting has kept Depeche on top of the world for four decades now. Is there an electronic band more successful?

Yet while we can blame Numan, the League, OMD, Clarke, Foxx and Jarre for bringing the sound of the synthesiser to the masses, we should also give some credit to the manufacturers of the machines, for if it hadn't been for the dramatic reduction in gear pricing over the late 70s and 80s, this decade of synth pop would not have been.

The big three Japanese players of Roland, Yamaha and Korg moved in to steal some of the thunder from the mostly American players like Sequential, Oberheim, Moog and ARP; their machines rocked at rock-bottom prices, simple as that. Synths from the Roland Juno and Jupiter, Korg MS, Mono and Poly ranges all made their mark, but it was Yamaha's CS-80 that became the first synth to define a soundtrack or two. Built in the 70s, yes, this synth was utilised more by Greek composer Vangelis than any other synth user and helped a film about running – *Chariots of Fire* – through the home stretch but, more importantly (if you are geeks like us), soundtrack an era- and genre-defining sci-fi film. *Blade Runner* took many years to fulfil its destiny, and through many different versions, but they all shared Vangelis' incredibly mesmerising soundtrack, which would not have been possible without this monster polysynth from Yamaha.

As popular as Vangelis' work was, it wasn't really the pop that made synth pop though, and

Depeche Mode with Vince Clarke and Martin Gore, two of the most successful songwriters of all time

Getty

for that we can thank everyone from Blancmange to Pet Shop Boys, Eurythmics to the Human League Mk2, a-ha to Soft Cell, Buggles to New Order and many (many) more. Synth pop was massive, but only really for a relatively short time before the technology changed the sound and people's tastes moved away from its lush analogue roots towards a more digital sheen.

Synth pop lost the analogue lustre and the 80s gave way to pomp, rock, SAW and dark times. Yes, the all-new digital synths, again from the big players, sold by the million – Korg's M1, Yamaha's DX7 and Roland's D-50 shifted record numbers – but they were largely used to replicate 'real' sounds rather than those of Electronic Music's analogue heyday. It would take an entirely different set of circumstances to bring Electronic Music back to the fore. And it would be an all-new version, and vision...

Electronic Dance Music

It's a phrase that is now looked upon with horror in some dance music circles, but the original 'electronic dance music', those oft-illegal repetitive beats that started off in the mid-to-late 80s, were the saviour of the electronic sound. Like many movements in music and culture, and indeed like our history of the Electronic Music machines above, there are many wild stories as to its origins, but you can safely say that, while Kraftwerk had some involvement, dance music's origins – like rock n roll before it – were most definitely black and US-based. New York Disco, Chicago House, hip hop and Detroit techno were the catch-all labels and artists like Afrika Bambaataa (hip hop), Frankie Knuckles, Farley 'Jackmaster' Funk, DJ Jesse Saunders and Marshall Jefferson (house), Phuture and Sleezy D (Acid house), Juan Atkins, Derrick May, Kevin Saunderson (techno) and many more all deserve mighty pedestals.

It would take an entirely different set of circumstances to bring Electronic Music back to the fore, and it would be an all-new version

As do instruments like the Roland TB-303 Bass Line and TR-808 and 909 drum machines. Roland didn't make these instruments for dance, it must be stressed – the 303 came out well before dance in 1983, designed as a bass accompaniment machine – but the artists above, and so many more, found these cheap, second-hand drum machines and synthesisers and abused them into a new and world-defining genre (and many, many sub genres).

The electronic beats and squeals provided by the Roland gear were a unique joint force that swept all before it. Bands like New Order and Pet Shop Boys bought dance sounds from the States to Europe and the mainstream and combined with – it must also be noted – the drugs of the time, helped dance music spread from the suburbs of the US cities to Ibiza, Manchester, Sheffield, London, Berlin and beyond. The 90s became the decade that started a million new dance genres, not to mention a million often unlikely producers.

Faceless techno

In a slight variation of the classic phrase, 'if you can remember the 60s, you weren't there', it could be said that 'if you kept abreast of all the dance genres that the 90s and 2000s produced, you are probably dead'. By bpm, dance music went from dub to drum n bass, trip hop to happy hardcore. Nothing was out of bounds, the more outrageous or faster the bpm the better. There were stars and mainstream hits – stand up Orbital, Prodigy, Leftfield and Massive Attack – but of the vast majority of DIY producers, of which there were thousands producing music relatively cheaply, most were faceless and disappeared as quickly as it took to produce a track, press and sell 1,000 white labels.

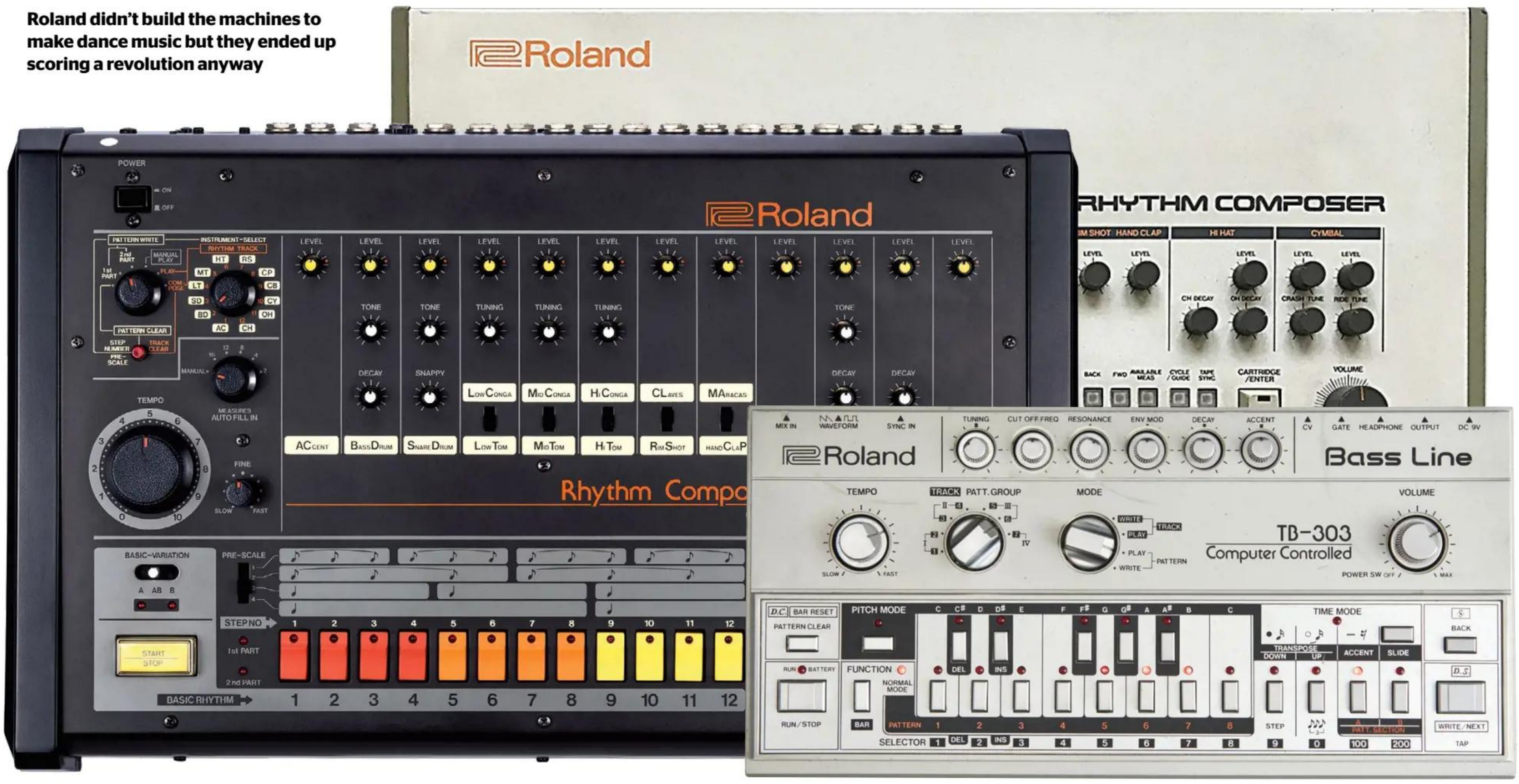
There were pointless debates over which was best – we're jungle purists and hate the newer drum n bass, obviously – and eventually dance music would have to evolve, and some would say *dissolve* into something altogether new. It shifted uncomfortably under its own weight – and of course, the money being made. Superstar DJs were born and lived in private jets and to this day, they raise their hands and tweak a volume knob in front of tens of thousands... and cash the cheque.

The big sell, ironically, was selling Electronic Music back to the States so 'Electronica' and 'EDM' became the new catch-all phrases. The new stars were the likes of David Guetta, Skrillex, Calvin Harris, Tiësto and deadmau5. The sound became massive, full of dubstep wobbles and bassline, well, bass. And the synths became harder... and softer. The appropriately-named Massive, along with Serum, became the most widely used synths in EM production, both made in software, but both as big-sounding as anything made with real electronic components.

So where are we now?

The 21st century hasn't all been about big basses and EDM – as we explain in our Amazing 21st

Roland didn't build the machines to make dance music but they ended up scoring a revolution anyway



Amazing 90s Electronic Music

The 90s was great for electronic dance music, of course, but there was also another movement of down-tempo trip hop that might not have always been as electronic in nature – samples came from everywhere – but its DIY ethos certainly took it cues from electronica. As well as the more obvious protagonists – check out anything from Massive Attack – you can find amazing productions by artists including DJ Shadow, Air, Bjork, Howie B, Laika, Lamb and many more.

On a more electronic tip, pretty much anything by Underworld, Orbital, Pentatonik, Plaid, Moby, The Chemical Brothers and LFO from this decade is worth tracking down, and Aphex Twin was in his most prolific mood, redefining ambient, jungle and anything in between. We've also mentioned Warp Records – just check out their *Artificial Intelligence* compilation that features everyone from Autechre to The Orb's Alex Patterson for a beautiful slice of 90s underground life.

Getty

Aphex Twin is just one of the names Richard James uses in a somewhat prolific career

Century Electronic Music box – but keeping abreast of any music now, especially within a genre so wide as Electronic Music, is both hopeless and massively *hopeful*; there is both too much and something for everyone. You can, should you wish, track down any genre – from electronic goth rock to ambient dub n bass, chiptune techno to modular synth pop – on any of the many streaming services out there (ok, we haven't tried those, but you get the point). Electronic Music is now used everywhere: from slabs of pure pop joy (The Weeknd anyone?) to searing soundtracks, from retro themes (*Stranger Things*, obv) to experimental soundscapes in video games, and from post-rock to generic rock and pop. (In fact, you could argue with the latter genres that *all* music is electronic these days – it's generally artificially created within computers, after all, but let's not open that particular can of worms.)

All these kinds of Electronic Music exist because any producer can put their music out in this DIY environment. We have countless tools at our disposal to create Electronic Music – there's a whole chapter to be written on Eurorack synths, for example, and just look at the software tools we are giving you with this book – and it easier than ever to do. You can get a complete recording studio on a Mac, PC, tablet or even a phone – music can be made literally anywhere, and released on just about anything.

You could now argue that *all* music is electronic, but let's not open that particular can of worms

But the joys of releasing your own music, without the constraints of needing a record deal any more, are tempered by the fact that, ironically, there are fewer big record companies and traditional media outlets filtering the vast amount – and we mean vast – of music out there. It's a sea of noise, but it is also one you can navigate. The new journalism is where to find the new filters which help you find the new electronic beacons: the blogs (Electrobuzz, Inverted Audio), the specialist magazines (this one!), the narrow but deep podcasts (including labels like Ninja Tune and Hospital Records) and the specialist radio stations (RA Exchange, Transmission Radio or check out Vince Clarke's Synthesizer Show at makerparkradio.nyc).

Electronic Music's history is as complex as the definition of the music that it has produced, but that is also its beauty and appeal. The search is as amazing as the discovery, and now there are more artists, yourself included, creating and distributing, and more listeners searching and filtering. To twist another expression, 'build it and they will come', we should close with 'produce it and they will listen'. That's what this guide is for. We supply the tools and tutorials, so we can inspire you to add to the complexity and beauty that is Electronic Music. Enjoy!

Amazing 21st Century Electronic Music

Our history concentrates on some of the main directions that Electronic Music took this century like dance music and EDM, but many other artists also deserve a mention and there are, of course, many more underground acts to search for.

And Electronic Music in this century really does, as you might expect, cover every spectrum of music, from the more pop leanings of The Killers, Future Islands and Chvrches to experimental composers like Jenny Hval, Boards of Canada and (at one time anyway) M83.

Then there are the once electronic producers who have broken through the ranks to the mainstream: Jon Hopkins is still widely regarded for his extremely dynamic electronic works, while also dabbling in tunes with Eno and Coldplay, while William Orbit went from *Strange Cargo* electronics to awards with Madonna – quite a journey in any electronic musician's book.

Then are also many acts that have rejoined the dots and bought the electronic sound up to date while unashamedly nodding to its past. Will Gregory and Goldfrapp certainly helped bring back the 'analogue' in synth, LCD Soundsystem and Daft Punk took elements of everything electronic and simply made them cool, while Ulrich Schnauss occasionally nodded back to Tangerine Dream before actually *becoming* Tangerine Dream.

Finally, over two billion Spotify streams can't be wrong. The Weeknd's *Blinding Lights* is probably the most high-profile synth pop tune of the last couple of years, having been number one the world over and shifting as many copies as any synth song. It wears its 80s roots well – those riffs could have come from any a-ha or OMD single – and proves that Electronic Music, in its purest form, is alive, well and as popular as ever.

The Weeknd – Electronic Music is alive, well, and well retro

Getty

The 1970s

The 70s was a decade where the synth came out of the design studio and into the recording studio, picked up by a varied bunch of producers and boffins, and tweaked to make electronic music that drifted from concrete ambience to cold, machine-like experimentation, before exploding into pop as the decade closed...

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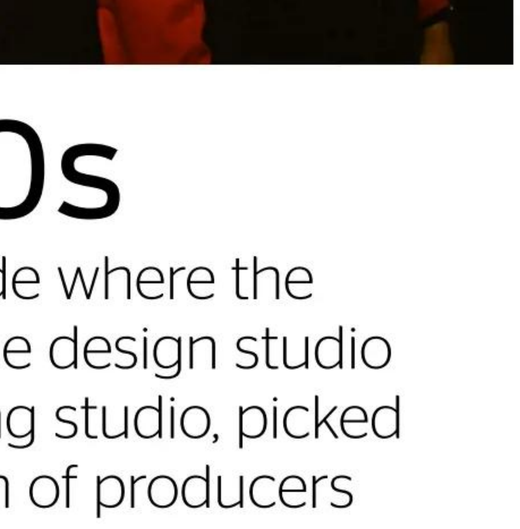
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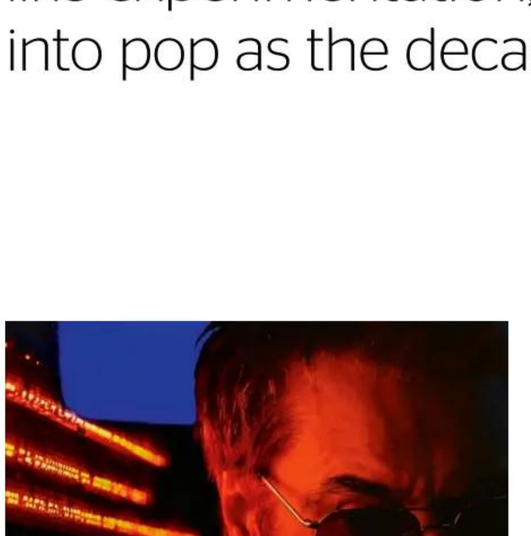
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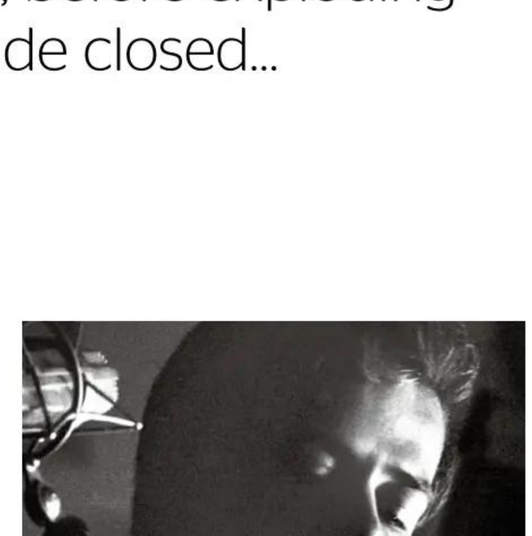
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RECREATE FAMOUS 70S SYNTH SOUNDS

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70s Electronic

With its syncopated sequences and cool cosmic chaos, the Berlin School of instrumental electronic exploration takes you on a trip beyond time and space

> Maybe it was written in the stars but a revival of the so-called 'Berlin School' of electronic improvisation seemed inevitable. Pioneered by a cadre of psyche rockers orbiting Tangerine Dream's Edgar Froese, the style is tied to its birthplace, though it's also referred to as Kosmische Musik. Initially a subset of kraut rock, Kosmische evolved away from the standard instrumentation of rock, instead leaning heavily into electronic experimentalism, initially with organs and tape treatments, and later with synths such as EMS' VCS3 and Moog modular systems.

It was a Moog 960 sequencer that first gave the Berlin School its signature sound – a chugging eighth-note rhythm first established by Tangerine Dream on their *Phaedra* LP.

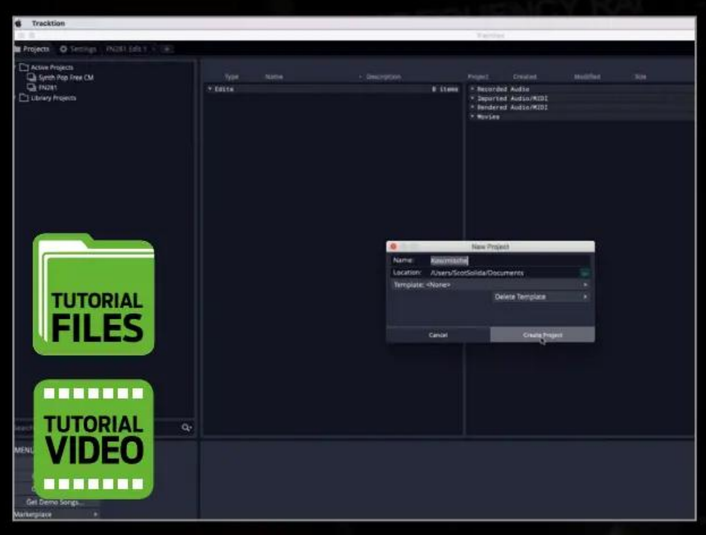
Ex-Dreamers Klaus Schulze and Michael Hoenig further developed the style in the 70s, even while Tangerine Dream themselves churned out a classic catalogue of astral atmospherics. The UK experienced a minor revival in the mid-80s/early 90s, with acts like Wavestar, Ian Boddy, Mark Shreeve, and Andy Pickford all displaying a clear influence.

The genre would return with the modular synth revival with artists like Node, Ron Boots, Radio Massacre and Parallel Worlds.

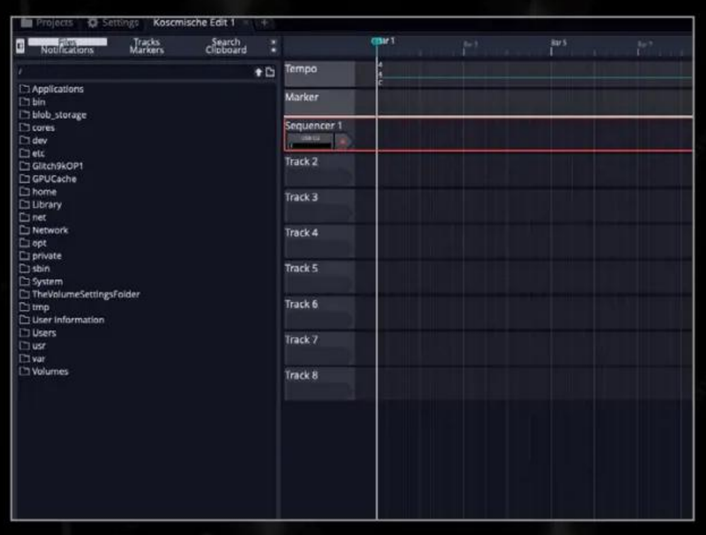
The style is easier than ever to accomplish – and we'll get you going with nothing but your DAW and the instruments and effects available at filesilo.co.uk (Bookazines/ Music Producer's Guide To Electronic).

>Step by step

1. The Sequence



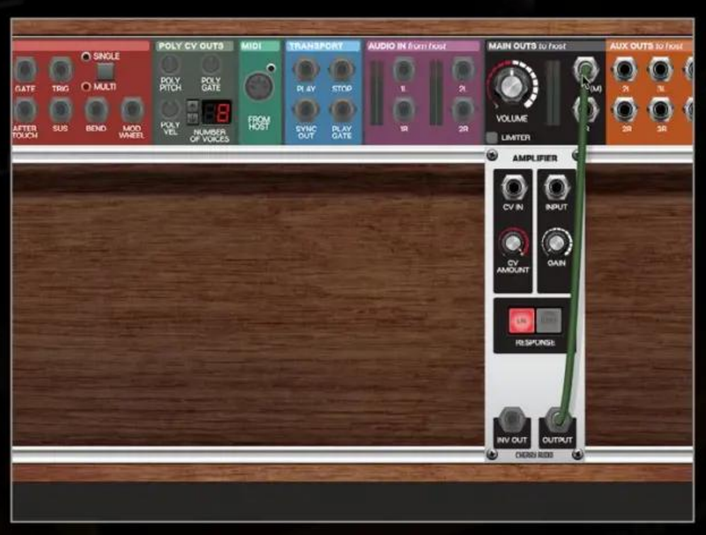
1 > In this tutorial, we'll show you how to build classic Berlin School-style sequences using software you already own, courtesy of our complementary plugin suite. Use your preferred DAW, but we'll be using Tracktion Software's free T7 DAW for our examples.



2 > We'll use MIDI tracks, so let's assign our USB MIDI controller keyboard to Track 1. In T7 DAW, this is done by using the drop-down menu that appears when clicking the empty slot in the track's header (left) and choosing an input. We've selected ours, labelled USB O2. We'll use this track for our first sequencer passage, calling it Sequencer 1.

3 > The sound of the Berlin School was defined by its use of modular synths and sequencers and we've got a humdinger in the **cm** Suite. It's called Voltage Modular Nucleus and it comes to us courtesy of Cherry Audio. In T7 DAW, the plugin can be instantiated by dragging the grey '+' icon to the left of the volume control on the track's right side.

4 > You'll see a drop-down with a 'Synths' category, from which Voltage Modular may be selected. Having done so, you'll be presented with a module rack. The top row includes panels that connect to your host and/or the outside world. All available modules will be shown in the browser on the left. You can click the Library button up top to reveal them.



5 > Modules are added from the browser. Start by adding an Amplifier, which can be dragged to the right side of the rack. Connections are made with virtual patch cables. These can be created by clicking and holding on a jack. Connect the Amplifier's Output to the 1L(M) jack in the Main Outs to host panel to route audio from the modular to the host.

6 > You'll need an Oscillator to make a sound, and a Filter module too. Find the Oscillator's Square Wave Output among the jacks at the bottom, and patch it to the FIlter's Audio In jack. Patch the Filter's Low-Pass Jack (bottom left) to the Amplifier's Input. Increasing the Amplifier's Gain knob brings the sound into play. Turn that knob back down to nil.

BERLIN SCHOOL CLASSICS

TANGERINE DREAM *RUBICON*

They invented Berlin School with *Phaedra*... and near perfected it by this. Moody Mellotron, constant stellar effects: quintessential.

bit.ly/td_rbcn

KLAUS SCHULZE *BODY LOVE*

The original EBM! Not sure what synths, sequencers, and astral drones have to do with the porno for which this was made, but it's a great Berlin School example.

bit.ly/ks_bdlv

VAN ZYL AND GULCH *REGENERATION MODE*

Van Zyl and Gulch's bands (Xisle and Nightcrawlers, respectively) were at the forefront of an active electronic music scene around America's East Coast in the 80s.

Order CD from starsend.org

STEVE ROACH *SKELETON KEYS*

Mr Roach's return to the sequencer-based style he deftly explored in the 80s. Accompanied by a massive modular system from Synthesizers.com, this is pulsating perfection.

bit.ly/sr_sk_kys

PRO TIPS

TRANSPOSITION

The sequenced patch we've described in our walkthrough allows the user to transpose the root note of the sequenced pattern to be changed on the fly. However, note that many legendary Berlin School performances stay on a single pattern, in a single key. In this way, they build unresolved tension while also allowing the performer to easily improvise over the top of the pattern. Keep it simple to keep it cosmic!

LAYERED SEQUENCES

We've only space to show you how to create a single sequence, but most good Kosmische tracks are made up of multiple sequencer patches, generally locked to the same master clock. For example, there might be a sequencer playing an 1/8th-note bass pattern, while another fires off rapid 1/16th-note arpeggios in a higher register. Yet another might be used to generate a percussive pattern. All of these might fade in and out to add interest and drama.

7 > For control over the Amplifier's Gain: add an Envelope Generator module and patch its Env Out jack to the Amplifier's CV In. Clicking the Env's Gate button triggers the Env, activating the Amp's Gain. Add the 8-Step Sequencer module. Route its Gate Out jack to the Env Generator's Gate In. Press the Seq's Start to trigger the Env Generator.

8 > Not very exciting! Not to worry. Stop the Sequencer. Adjust its Rate to 90bpm. Note the rows of buttons/sliders. The buttons determine if a step is heard, the sliders the frequency or voltage of that step. Connect the Sequencer's Output to the Osc's Keyb CV jack. This lets the Sequencer control the Osc's pitch. Adjust the sliders for a different pitch each step.

9 > Our pattern consists of C2, C2, G2, E2, C3, G3, C3, E3. Now shape the sound a bit. With the sequence playing, reduce the Env Generator's S(ustain) slider to nil and set its D(ecay) and R(elease) sliders to 200ms. This causes the Env to shape the volume over time. Now, reduce the Filter's Cutoff to 800Hz and increase Resonance to around 24% for a muted tone.

10 > Next, route the Envelope Generator's Env Out to the Filter's Freq Mod 1 input and set the Filter's Mod 1 Amount to 30%. This causes the Filter's Cutoff to be shaped by the Env Generator. We need a Delay module. Disconnect the Amplifier's Output from the Main Outs and send it to the Delay's Input instead. The Delay's Output should go to the Main Outs 1L(M).

11 > Berlin Schoolers such as Klaus Schulze liked using a keyboard to transpose the sequence. We can do the same by going to the CV Outs panel and patching its Pitch Output to the Osc's Keyb CV, alongside the cable coming from the Sequencer. You'll want to lower the Osc's Range to 32'. Now, our CMaj pattern can be transposed via incoming MIDI notes.

12 > Set host BPM to 90. Lash the Seq to the host with a Sync Divider module. Find the Transport panel. Connect its Sync Out to the Sync Divider's Sync In. Route the Sync Divider's Clock Out to the Seq's Ext CLK jack. Click Ext. Patch the Transport panel's Play and Stop jacks to the Seq's Start and Stop, respectively. Now, the host's transport controls the sequencer.

Ratcheting

In recent years, there has been a resurgence in the sound of 'ratcheting', though it only occasionally surfaced in the original Berlin School recordings.

Pioneered by Tangerine Dream (who else?), ratcheting is a sort of rapid-fire rhythmic accent, not unlike the beat-repeat functions found on modern sequencers. Ratcheting is often used at the beginning of a sequencer pattern to add a layer of pseudo-complexity to the proceedings – a welcome bit of interest to offset the redundancy of the constant 1/8th-note sequences. Excellent examples can be found on Tangerine Dream's *Stratosfear* LP.

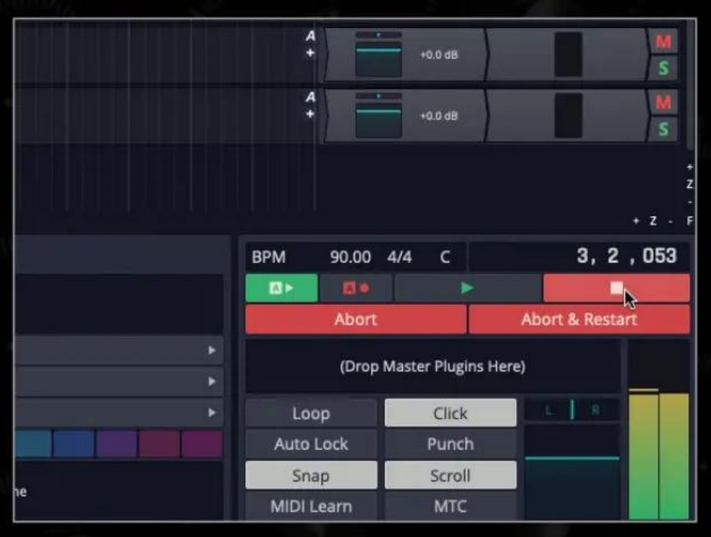
Today, a ratcheting might be included in amongst a sequencer's many features, but there are many ways to create the effect. In the hardware world, where space and economics limit the number of modules on hand, synthesists often employed LFOs to fire off clustered triggers. However, today's software modular systems allow us to more easily create ratcheting simply by employing more sequencers. You can, in fact, find a very good example among Nucleus' presets. Call it up and give it a listen.

> Step by step

2. Atmospheres and automation

1 > We keep harping on the improvisational aspect of the Kosmische classics. It's time to start building up some atmosphere, and for that, we're going to improvise. Mute your sequencer track and instantiate the CM edition of Xils Lab's PolyKB II, selecting the preset pad sound called PA Icebergs II LtZ.

2 > Engage the click on your DAW (and ensure a count-in during recording), and arm your new track for recording. Try improvising a simple passage in, oh, EMaj. We've allowed our final note to sustain for some time, and our entire clip stretches across the first 16 bars. This will act as our introduction.

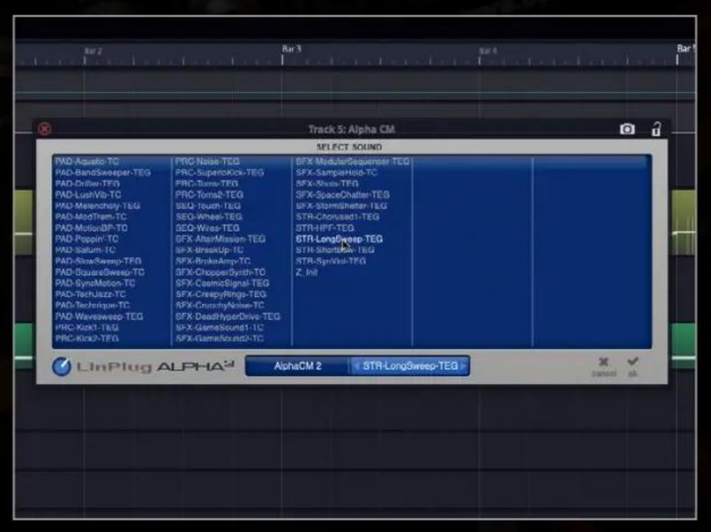


3 > Let's assign our Filter Cutoff to a knob on our hardware keyboard controller. Open PolyKB II's Option menu and select Open MIDI Settings Panel. Parameter 1 is assigned to control the Filter Freq, and is currently displayed. Click the Learning button and waggle a knob on your controller to assign it to this parameter.

4 > Now, with recording engaged, overdub the clip with some real-time knob-tweaking using your newly-assigned MIDI parameter. Keep it simple and gradual. If you like, you can assign another hardware knob to the synth's Filter Resonance and record a pass of that one, too. Any parameter is worth a try.

> Step by step

3. Additional elements



1 > We're off to a good start, but we need to flesh things out. Let's add another instance of Voltage Modular and create another sequenced patch using the same methods we described earlier. This sequence will provide the bass notes. As before, we'll lash it to the host's transport and tempo.

2 > We could use another sound in the intro. A warm string sound might be nice, so instantiate SynthMasterCM on a new track and select the preset called STR Simple Saw MK. Making sure the sequencer tracks are muted, lay down some chords in the key of EMaj, holding the last until bar 25.

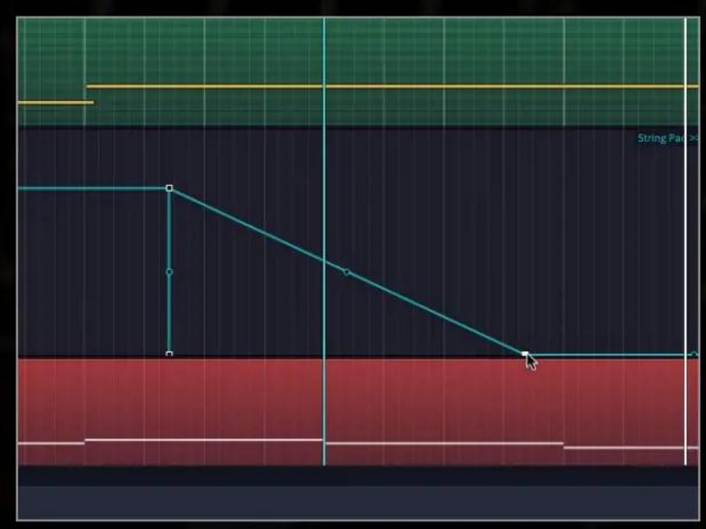
3 > Let's add one more polysynth to our palette. This time, it'll be Alpha CM, and we'll choose yet another string pad, a preset called STR-LongSweep-TEG. We're not going to track it just yet – we'll wait until the next walkthrough for that. However, we'll have it ready to rock for when the time comes.

> Step by step

4. Arranging and mixing

1 > Now it's time to start laying down some tracks. Start with our sequencer patch on Track 1, temporarily muting all of the other tracks. The idea is to let the sequencer play, while recording the transposition from incoming MIDI notes. We've repeated a 17-bar, four-note passage, and quantised the results.

2 > Do something similar with the second sequencer-based track (remembering to un-mute it). Play on for however long you like, and edit it down later. Note that we've bucked the tradition of sticking to minor keys and gone for something a little more upbeat, but you can adjust your sequences as you like.



3 > Here, we've rearranged our tracks a little, with our intro tracks up top. We've reduced the gains of both sequencer tracks so that we hear only our intro pads. We want our intro pads to fade out at around bar 17. You can do this in real time or by manually editing the automation curves.

4 > We'll use the same technique to fade in our first sequencer track at around bar 17. Our second sequencer track will gradually fade in later, at around bar 49 or so. We'll fade out the first sequencer track before the end, allowing the second sequencer patch to play a bit longer before fading.

5 > Now it's time to track some slow string passages using the FreeAlpha strings we instantiated earlier. We're just using some simple dyads based on the root notes of the sequencer transpositions. We've processed the track with STARK CM and its LoFi ARP preset, which includes a lovely vintage phaser sound.

6 > We've faded our phased Free Alpha strings in and added some ambient FM bells from a new instance of SynthMaster CM on track 7. Obviously, we've only scratched the surface, and we'll leave it to you to add more – a lead, sound effects and other elements of interest along your cosmic journey.

Drum role, please

Drums rarely play the same sort of role in Kosmische Musik as they do in other genres. When Tangerine Dream kick-started the Berlin School with their *Phaedra* album, they tapped into Moog's 960 sequencer module to create a sense of rhythm in lieu of employing an actual drummer. The chugging 1/8th-note sequencer passages provided the pulse while the band improvised with various other instruments, drawing the blueprint for future Kosmische performers, many of whom would similarly eschew acoustic and electronic drums in favour of the gentle tick-tock of the sequencer.

One-time drummer Klaus Schulze did, however, incorporate live acoustic drums, often played in a freeform, improvisational manner. Still, the sequencers and synthesisers

Moog's 960 sequencer module

provided the main rhythmic thrust of those performances.

Still others would use drums as a rhythmic accent, adding a muted kick or steady ride cymbal to nail down the beat divisions. And very few – such as the UK's Wavestar and Mark Shreeve – would go so far as to add drum machine patterns to accentuate their interstellar endeavours.

POWER TIP

> Ground control

Some of the best Kosmische Musik recordings have been recorded live, directly to two-track tape/disc. These recordings are mixed in real time, usually by the performer, and often merely by controlling the volume levels of the synths and other instruments at the source. When a mixing console is used, it too can be used as a performance instrument, allowing the aural astronaut to fade in and out various sequences, tape or sample loops, and other pre-recorded or programmed passages. In such cases, a USB fader box might be the perfect companion for your sonic space journeys.

JEAN-MICHEL JARRE

Jean-Michel Jarre is very much 'The Godfather' when it comes to Electronic Music. Here he delivers a music history lesson and a glimpse into the future

> "I am pleased to be talking to you," says Jean-Michel Jarre after realising he is going to be questioned about studio technology. "You see, I have spent far more of my life with computers and machines than I have with human beings. I think that people reading this will understand my situation. It's a good situation as far as I'm concerned. I always feel comfortable with my machines!"

The Godfather of Electronic Music is one of those phrases that always sparks intense debate and, occasionally, bitter argument. For some, it's Kraftwerk. Others favour Pierre Schaeffer and the Musique Concrète movement. Perhaps you'd prefer Stockhausen or Subotnick. Or Delia Derbyshire – the Godmother? Then, of course, you have to throw Moroder, Numan, Detroit, Chicago and Krautrock into the ring. And King Tubby. And Bambaataa. And Morgan Khan. And Eno. And... Jean-Michel Jarre.

Whatever your musical preferences, there is no denying that Jarre has had a huge and groundbreaking impact on the development of Electronic Music. His best-known album, *Oxygène*, was released in 1976, a time when synthesisers and drum machines were seen as little more than musical gimmicks.

"Back then, people bought synthesisers to make some silly noises on their next album," laughs Jarre.

But Jarre was intent on proving that machines needed to be taken seriously by the music business. And, as we all know, the only way the music business will take something seriously is if you shift units. So that's what he did. *Oxygène* topped the French album charts, made Number Two in the UK and was Top Ten

©EDDA

across Europe. To date, it has sold 13 million copies, and is the best-selling French album of all time.

The album's single, *Oxygène, Pt. 4*, went to Number Four in the UK, which meant that, excitingly for enthusiasts, synths were all over *Top of the Pops* and burbling out of breakfast radios in Billericay, Mansfield and Swindon. Thanks to Jarre, the VCS 3, the ARP 2600 and the Korg Mini Pops were now part of the mainstream musical landscape.

Sipping water in his London PR's office, Jarre looks ludicrously healthy and could easily pass for mid-50s – he's over 70! Well over four decades after that initial success, he must have talked about music and technology thousands of times before, but the mention of Arturia's Solina V string machine, Ableton Live or the latest MacBook Pro seems to light up his face and he's off... excitedly explaining a story about his grandfather's home-made portable turntable or the all-round capabilities of Kontakt software.

Jarre has certainly kept up with music and technology; in fact you can mark many of his releases and successes over the years with significant and historical technological themes: from panning hard stereo in *Oxygene* to wowing (literally) millions with 'laser harps' across the world in incredible concerts, to exploring sampling in his later albums, to then shifting his entire analogue synth collection on the road for an intimate tour of *Oxygene*, the technological story is almost as fascinating as Jarre's.

And he's kept up with the music too. 2018's *Planet Jarre*, is perhaps the best way to explore the Jarre legacy for a newcomer, with everything from back-catalogue tracks to newer collaborations with the likes of Vince Clarke and Armin Van Buuren.

"These albums are helping me celebrate 50 years of making Electronic Music," he says. "Thank God I never listened to my mother. She told me that music and machines would never be a good partnership. She wanted me to learn the violin!"

> "We are curious creatures, and Electronic Music offers us another way to explore the unknown"

You've been making music for five decades now, but isn't it true to say that you were actually tinkering with noise even as a young kid in the late-50s and early-60s?

J-MJ: "Yes, I was. My main inspiration was my grandfather, an engineer and fantastic inventor of strange things. He made one of the earliest mixing consoles that was used in France... and he also invented the iPod!"

Hang on a minute...

J-MJ: "OK, I'm not being completely serious, but he made me a portable turntable that ran on batteries. I could sit in the garden and listen to my favourite records. It was an exciting moment. Like a kid who's getting his first Walkman or iPod.

"I used to love visiting his workshop because it was so full of imagination and ideas. He would tell me about a new device he was working on or explain how an amplifier worked. This was the atmosphere I grew up in. Technology was part of my everyday life.

"One day, he gave me his old Grundig reel-to-reel tape machine. It was very small and portable, so I would record all sorts of strange sounds on there. By accident, I played one of the tapes backwards and... wow! I heard a whole new universe of sound. At the time, I was a member of a few local rock bands and I started to introduce this backwards music into my guitar solos. I tried to find melodies and fills that would sound better when they were being played backwards.

"This led me to other kinds of investigation. I was no longer just interested in the notes... I was interested in the sound itself. Processed sound. My friends began to notice this and one of them said, 'My father knows a place where there are lots of people like you. You should go there'. It was 1968 and this place was the Groupe de Recherches Musicales in Paris, run by Pierre Schaeffer." [The GRM came into existence in 1958, following the dissolution of the Groupe de Recherche de Musique Concrète, which itself had been formed by Schaeffer and fellow pioneers, Pierre Henry and Jacques Poullin. During its short life, the GRMC attracted a long list of musical innovators including Stockhausen, Messiaen, Pierre Boulez, Edgard Varèse and Michel Philippot.]

So that's when and where you first started experimenting with sound?

J-MJ: "You have to remember what was happening in 1968. There were riots not only in Paris, but all over the world. Revolution was in the air. For me, making Electronic Music was part of the revolution. It was rebellion; it was punk rock. We were trying to fight with the traditional world of music... against classical and mainstream rock.

"My big argument was that music does not always have to be about the notes. There were people at the Groupe de Recherches Musicales who could not play a single instrument. Mathematicians, philosophers and painters who had no traditional training, but they were brilliant musicians. They didn't approach music with notes – they approached it with sound."

But you also studied 'traditional' classical music... wasn't your tutor from the famous Conservatoire de Paris?

J-MJ: "Yes, yes. Of course. But I was always in trouble with my tutor because as soon as learned a new piece of music, I wanted to improvise. I heard new ideas and melodies in my head. I couldn't understand why music had to be in this rigid framework. Why do I have to play this over and over in the same way? There were times when it was almost destroying my love of music. I could not just stay in the same place... I was already keen to know more.

"And that is probably the main reason why I had so much faith in Electronic Music. At the time, people thought that we were just stupid kids playing with machines, but I was absolutely convinced that Electronic Music – the mix of technology and music, working together as friends – would become the major genre of the 21st century. We are curious creatures, and Electronic Music offers us another way to explore the unknown.

"At first, there were only a few people who felt like this, but the prophecy has come true. Technology and music have become a partnership. As technology develops, it pulls

J-MJ is one of the few people who can pull off the 'key-tar' look

©Erik Voake

Jean-Michel splits his time between his studio in LA and this one in Paris

music into the future. Because we must never forget that, throughout history, it is the technology that has dictated the musical style. It was the violin that led Vivaldi to his music. It was the 78 RPM record that dictated the length of a song. Elvis sang three-minute songs because that's all the information he could get on the record. It was the long-playing album that allowed groups like Pink Floyd and myself to create concept albums.

"And once we introduce the computer into the list of technology, the doors are smashed open. The computer is as important as Gutenberg and his printing press almost 600 years ago. It has fundamentally changed our lives. And, for us musicians, it has changed the way we make music. Technology gives us the impetus to make our ideas become real."

You've also argued in the past that there are inherent problems that come along with new technology...

J-MJ: "Hmm... yes, yes. Definitely! How can I explain this? OK, so I come from Lyon in France, which is one of the great centres of French cuisine. These days, we know that cooking is a real art, because you're mixing different flavours and ingredients... you are adding your emotions in there too. You are cooking with your soul.

"There are some people who are in the kitchen and they say, 'I must get this book because it will help me be a better chef. It will solve all my problems'. Thanks to Gutenberg, the bookshops are full of cook books, so that person will have plenty of choice. Unfortunately, even though the book shops have many books, not all of them will be useful. Some of them will never be opened and go straight to the recycling plant.

"But even when you find a useful book, it will not solve all your problems. That book alone will not make you a brilliant chef. Attempting to make some crazy recipes will not make you a brilliant chef.

"It is the same with music. Like cooking, it is an art. Instead of vegetables and spices, you have samples and reverbs. In cooking, you have cookbooks, and in music you have plugins. There are lots of them. There are some that will be uploaded at the time you start reading this interview and they will be already obsolete by the time you finish. If you fall into the trap of thinking that one hundred new plugins will get you a career in music, you are finished. You run the risk of murdering your creativity.

"My advice is – and this is the same for hardware or software – choose carefully. Take

> "Technology gives us the impetus to make our ideas become real"

(Very) Selected kit list

HARDWARE

MacBook Pro
Ableton Live 10
ARP 2600
EMS VCS 3
Moog Sub 37
Dave Smith OB-6
Mellotron M4000D
Digisequencer matrix sequencer custom-built by Michel Geiss

SOFTWARE

Arturia V-Collection
Synapse Dune 2
Korg Legacy collection
Native Instruments Kontakt and Reaktor
iZotope Ozone 8

Photography Mark Tso

Oxygène and its simple setup

"Of course, I've always been very pleased with *Oxygène* and I'm proud of what it has achieved. I wanted to create real songs with machines, and wanted those songs to exist as a proper album. This music was not a joke to me.

"I had no studio. Just a spare room in my home that had been the kitchen. I took all the kitchen equipment out and installed my musical equipment... very minimal. There was the VCS 3, the ARP 2600, the Eminent 310, an RMI Harmonic synth, a Small Stone Electro Harmonix guitar pedal, a Korg Mini Pops for the loop and my Revox which helped me create the delay. I have always said that the biggest trick on *Oxygène* is creating a big delay on the right, a delay of the dry left signal. That, for me, is what caused 50% of the album's success.

"Ah, there was one other instrument: a broken old Mellotron. Only a few of the notes actually worked, so I had to choose my chords and melodies from the notes that were available to me. Just because you are limited by notes, does not mean you have to be limited musically."

three or four instruments and use nothing else for six months. Get to know them. That is the best way of nurturing your creativity. That is how you will learn to express yourself... the music will be guided by the technology, but it will come from inside you. It will be filled with your emotions."

And of course, you are now a big user of the latest software to make music, and have gone from Pro Tools to Ableton Live?

J-MJ:"Pro Tools went over the top. It all became too expensive. Every year, they were making big changes and you have to surround yourself with all the extra hardware, otherwise nothing would work. Then I tried Ableton and... yes, it changed my life. Finding Ableton Live was as important for me as seeing my first multitrack or my first synthesiser. It has made my time in the studio so much easier.

"In fact, I no longer need to be in the studio, or even on the ground. When I was finishing off this new album, I was listening to what I thought was the final master on a plane to the Middle East. I heard two or three very tiny changes I wanted to make. With Ableton Live and my laptop, I made the changes, sent them to one of my production team while I was changing planes, and then had the new master ready by the time I arrived at my destination. It's crazy... crazy, but wonderful.

"I think Ableton 8 was the first version that held my attention, but it still felt a little bit too much like a DJ tool. The sound quality wasn't quite as I would like. But, from 9, it has been perfect. Lots of people say that the sound quality of Pro Tools is better, but I compared a bounce from Ableton and Pro Tools, and Ableton was more transparent. None of that 'phasing' effect. One of the tracks on the new album had 110 tracks, but Ableton remained stable and very flexible. Even when I was adding more plugins. With Pro Tools, you only need one bug and the whole thing crashes. Then it takes 20 minutes to get everything set up again!

"I have been working with the Ableton team, trying to improve and contribute a little bit because I think it's a fantastic platform. Pro Tools started to feel like you must pay to play. Every year, you must give more money... a bit like Dolby used to be in the early days. Pay a yearly rental or it won't work. You are making a Faustian pact and I don't like that."

And what about other software?

J-MJ: Synapse Audio Dune, the Korg Legacy Collection. Native Instruments Reaktor and Kontakt – if I could only use one plugin, it would be Kontakt because it offers you so many possibilities. The Arturia V-Collection, of course. Their latest version of the ARP 2600 is so close to the real thing. I am a big fan of the ARP... and I have been using one for a long time, so I do know what I'm talking about!"

Presumably a lot of hardware too?

J-MJ: "Always! The ARP, VCS 3, Moog 37, Dave Smith OB-6, the new Mellotron M4000D. I like to keep my old string machine, too, the Eminent 310. That is maybe the one area where digital tech has not been able to match the sound of analogue. The Arturia Solina V is pretty good, but then again, there is something that happens inside the hardware... something with the chorus that cannot be reproduced. Yet it will happen eventually. In five or ten years, we will see the technology.

"We have to accept that, sometimes, there are delays with technology. Look at 3D in the cinema. I don't think it will be accepted until people can access it without those terrible glasses. And 5.1. I have re-recorded some of the tracks on the new album in 5.1 because I think it is fun, but I know that not everyone has the luxury of being able to sit in the middle of all those speakers. I'll say it once again, technology is delayed in this regard, but it will catch up one day. It will evolve naturally for your mobile and your headphones.

"What an exciting period in history, eh? And, more than that, what an exciting time to make music. In the past, we were limited by the technology we had, but now... the only limit is your imagination."

HEAR MORE

Oxygène, Pt 4
bit.ly/jmjoxy

Equinoxe
youtube.com/watch?v=sebSXrmdo1Y

jeanmicheljarre.com
soundcloud.com/jeanmicheljarre
twitter.com/jeanmicheljarre
facebook.com/jeanmicheljarre

Oxygene IV

Jean-Michel Jarre

Year: **1976**

Original Synth: **ARP 2600**

Plugin used: **Cherry Audio Voltage Modular**

> We're going to recreate some famous synth sounds using the plugin instruments and effects that you can download from filesilo.co.uk, all free with this guide. And we're opening with a classic from Jean-Michel Jarre...

By 1976, the synthesiser had infiltrated the mainstream. Adopted and integrated by big-name rock and pop musicians, sounds once associated with the avant-garde were now sprinkled amongst the electric guitars, electric pianos, horns and strings that formed the backbone of most hit records of the day.

And yet, the all-electronic album was a rarity. Kosmische groups like Tangerine Dream and Klaus Schulze had tapped the charts with influential synthetic masterpieces, as had Moog classicalist Isao Tomita, but their work could hardly have been considered mainstream. Their records were beloved by 'the heads' to be sure, but no one was whistling "Mysterious Semblance at the Strand of Nightmares" on their way to the corner shop!

Jean-Michel Jarre changed all that with *Oxygene IV*. Like the rest of the *Oxygene LP*, *Oxygene IV* was recorded at home, in Jarre's kitchen. A handful of instruments were used, among them an EMS VCS3, and Eminent 310 organ/string machine, an RMI Harmonic Synthesizer, and an ARP 2600.

These instruments were painstakingly overdubbed and layered onto an eight-track recorder. Most of the processing came in the form of tape echo and guitar pedals.

While ambient at times – even psychedelic – *Oxygene*'s signature quality is its tunefulness. Jarre is a master of melody and arrangement. *Oxygene IV* is ever so slightly mysterious, but entirely optimistic.

An unlikely hit, *Oxygene IV* climbed to number 4 in the UK single chart, and is arguably Jarre's most recognisable composition. Both the single and the LP from which it was drawn made an indelible impression on generations of would-be electronic musicians.

Today, Jarre's once unusual approach – a lone artist composing and recording at home with a handful of electronic instruments – has become commonplace, as easy for us now as it was difficult for Jarre at the time...

> Step by step *Oxygene IV* brass lead

1 > We'll use Cherry Audio's Voltage Modular Nucleus to approximate Jarre's ARP 2600 synth. Clicking New in the upper-left clears our rack, we'll grab a Mini LFO and pair of Oscillators from the Library. We'll get a 6-Input Mixer, a Filter, and a pair of Envelope Generators. We'll also grab an Amplifier, a Spring Reverb and a Delay module.

2 > Let's start patching. We'll run cables from the CV Sources' Pitch jack down to each Oscillator's Pitch CV jacks. We'll run cables from the CV Sources' Gate down to each Envelope's Gate In jacks. We'll patch our Oscillator's Sawtooth jacks to the first two inputs of the Mixer module. The Mixer's Master Output will go to the Filter's Audio In.

3 > The Filter's Low-pass Output (bottom-left) goes to the Amplifier's Input. The Amplifier's '+' Output goes to the Reverb's L(M) Input, and the Reverb's L Output to the Delay's Input. The Delay's '+' Output goes to the Main Outs 1L(M) jack. Route the left Envelope's Positive jack (bottom-right) to the Filter's Freq Mod 1, and the right Envelope's Positive Output to the Amplifier's CV Amount.

4 > Set both Reverb and Delay Mix fully dry for now. Patch the LFO's top Output to each Oscillator's Freq Mod jack. Give the Freq Mod knobs a tiny push in either direction. Turn the Mixer's first two channels down a bit. Set one Osc's Frequency to -0.03 and the other to 0.03. Go to the Filter. Turn the Cutoff down to around 30Hz and Resonance to 16%.

5 > Turn the FIlter's Freq Mod 1 knob up nearly full. In the left Envelope, set the Attack to around 60ms, and the Release to over 7000ms. In the right envelope, the Attack should be about 65ms, the Decay fully up and the Release set to around 2400ms. It's all a bit high pitched, so set each Oscillator's Range to 32'.

6 > Now adjust the Spring Reverb and Delay's Dry/Wet Mix levels to taste. We'll do a bit of fine-tuning to the various parameters. The patch is nicely responsive to the length of time notes are held, so experiment with performance style. This is obviously a simplified version of Jarre's classic ARP 2600 patch. You can elaborate further upon it as you see fit.

AMBIENT

Atmospheric, ethereal, meditative or moody, this misunderstood music is becoming increasingly popular as the tools used to create it have become more accessible

> The term 'ambient music' was coined in the 70s by ex-Roxy Music band member and ostrich feather aficionado Brian Eno, who developed new ideas about music while incapacitated after a car accident. As the story goes, a visitor put on a record on her way out of the room. Unable to turn up the hi-fi, Eno relaxed to the sound of barely audible music merging with that of rain from outside. "This presented what was for me a new way of hearing music – as part of the ambience of the environment just as the colour of the light and the sound of the rain were part of that ambience."

Eno was familiar with Satie's concept of furniture music (music to be enjoyed in the background) and the tape compositions of Steve Reich. He combined the two approaches on his next LP, *Discreet Music*, fully realising it on 1978's *Ambient 1: Music For Airports*.

With its focus on atmosphere over melody, Eno's ambient records were a radical change from his previous art rock and left some reviewers confused. Still, they had a lasting impact on experimental instrumental ambience in genres as diverse as industrial and new age.

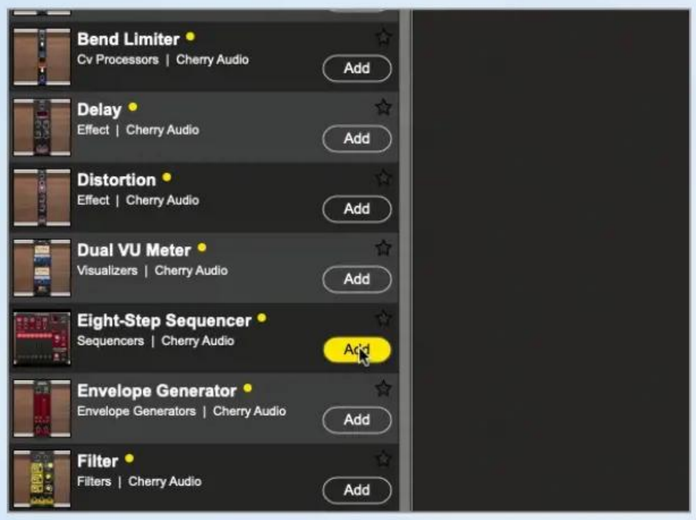
Ambient techniques would be adopted by experimental dance musicians in the 90s, not least Aphex Twin.

Let's explore how to create an ambient track using the **cm** Plugin Suite and samples that you can find at filesilo.co.uk (at Bookazines/Music Producer's Guide To Electronic).

>Step by step

1. Modular synth ambience

1 > In this tutorial, we'll create an ambient patch using Cherry Audio's Voltage Modular Nucleus. Combining the flexibility of a modular synth with a systematic approach like those used by Brian Eno can yield great results to be enjoyed alone, or serve as the stimulus for a more complex production. Let's fire up Voltage Modular Nucleus and click New to wipe the slate.



2 > Our goal is to create a patch that allows some control over the notes and sounds, but still offers some element of chance. We'll do that in a way similar to that used by Eno on *Discreet Music*, by combining slow sequences with different tempos. Start at the module browser on the left and find the Eight-Step Sequencer module, then click the Add button.

3 > A sequencer needs something to sequence, so drop the Oscillator module into your rack. Next, find a Filter module and bring that in, too. Find the Square/Pulse Output at the bottom of the Oscillator and run a cable from that into the Filter's Audio In jack. You'll need an Amplifier module to hear your sound, so bring one of those in as well.

4 > Stick with the traditional low-pass filter for now, running a cable from the Filter's Low-pass Output (bottom-left) to the Amplifier's Input jack. We want echo; grab a Delay module and patch the Amp's "+" Output to the Delay's Input. Route the Delay's "+" Output to the 1L(M) jack in the Main Outs to host panel up top. Give the Amp's Gain a nudge to hear the sound.

5 > Turn the Amplifier's Gain back to nil for now. Let's bring that Sequencer into play. Patch its CV Output jack up to the Oscillator's Pitch CV input. This will cause our sequencer to control the notes played by the osc. Deselect all of the Sequencer's Step On/Off buttons, save for 1, 3, and 7. Nudge step 3's slider up to E3, and step 7's value to G2. Step 1 will remain on C2.

6 > Find the Sequencer's Rate knob and turn it all the way down to 3.8bpm. Slow. Very slow! Click the Sequencer's Start button to set the sequence into motion. You can give your Amplifier's Gain knob another nudge to hear your handiwork. It's not too interesting, is it? Crank your Delay's Time full, and set the Feedback to 66% or so. Still not great!

FOUR AMBIENT CLASSICS

BRIAN ENO
AMBIENT 1: MUSIC FOR AIRPORTS
The aforementioned 'non-musician' may not have invented ambient music, but he did give it a name with this LP.

bit.ly/be_a1mfa

STEVE ROACH
DREAMTIME RETURN
This genre classic fuses Roach's electronics with aboriginal chants and perc. Inspired by a trip to the Outback, it's evocative and – for some – transformative.

bit.ly/sr_dtr

KEVIN BRAHENY
LULLABY FOR THE HEARTS OF SPACE
Two improvisational recordings, created using Braheny's Mighty Serge Modular analogue synth system: deep, cosmic, utterly epic.

bit.ly/kb_lfthos

ROBERT RICH, B. LUSTMORD *STALKER*
Always associated ambient with the saccharine vibes of new age? This often terrifying record will shatter that illusion. Unnerving, inspiring and best enjoyed in the dark.

bit.ly/rrbl_stkr

PRO TIPS

BEAT THE CLOCK
Though many ambient recordings are underpinned by rhythms, it can be inspiring to ignore tempos, time signatures and any other indicators of time. Ambient music is often best when meditative and untethered by trivial restrictions. Rhythms are fine, but you might find it useful to ignore bar lines or metres. If you like exploring rhythms, consider introducing polyrhythmic tracks, combining patterns with different lengths.

ENVIRONMENTAL PROJECTION AGENCY
Long before Captain Eno defined ambient and well before label marketeers jumped onto the term 'new age', people were making and selling recordings of the natural environment. Field recordist Irv Teibel's 11-part *Environments* series kicked it all off in 1969. Soon, all manner of thunderstorms, sea breezes and other such ambiences were being used as meditative (or in some cases medicative) music. Thanks to your phone's built-in mic, such recordings are now a cinch to capture.

7 > Set the Filter's Cutoff to 66Hz and nudge Resonance up to 40% or so. The sound all but disappears. Add in a Mini LFO from the module browser, dragging it to the left of the Filter. Patch the LFO's topmost Triangle wave to the Filter's Freq Mod 1 jack, and set Mod Amount to about 80%. Next, reduce the Mini LFO's topmost Rate knob to 0.08 Hz.

8 > Disconnect the Delay from the Main Outs and stick a 6-Input Mixer in, with the Delay routed to input 1 on the Mixer, and the Mixer's Master to the 1L(M) jack on the Main Outs panel. Add another Seq, Osc, Filter, Amp, and Delay module below. Patch the new modules as before, sans LFO. Route the second Delay's "+" Output to the Mixer's second input channel.

9 > Set the new Sequencer's Rate to 4.7bpm. Deactivate its Step On/Off buttons, save 1, 5, and 7. Set step 5's slider to G3, and step 7's slider to C4. The new Osc's Range should be 8'. Set your new Filter's Cutoff to about 165Hz and its Res to 60%. Route the existing Mini LFO's bottom-most Triangle out to the Filter's Freq Mod 1 and nudge its Amount knob.

10 > Set the Mini LFO's bottom Rate to 0.05Hz. Bring your second Amp's Gain knob up a bit and start the second Sequencer. That second Delay's Time needs a push up to, oh, around, 1600ms. Your sequencers should be colliding gently at unpredictable times, with the LFO shaping their timbres. Our notes were selected to ensure harmonic coherence.

11 > Let's add another Osc, Filter, Amplifier, and Delay. Route the Osc's Sawtooth wave into the Filter, and the FIlter's Band Pass Output into the Amp. The Amp's "+" Output goes to the Delay, and the Delay's "+" Output into Mixer channel 3. Now, add another Mini LFO and route its topmost Triangle Out to the new Amp's CV Amount jack. Set the LFO's topmost Rate to 0.11 Hz.

12 > The new filter's Cutoff and Resonance should be around 206Hz and 20%, respectively. Route the new LFO's bottom Triangle output to the new Filter's Freq Mod 1 and nudge the Mod Amount knob. Set the LFO's bottom Rate to 0.03Hz. Adjust the new Delay's Time, and tweak your Mixer's levels until you've got the perfect mix. We could listen to this all day!

Operating systems

A lot of ambient music is created with little or no real-time on the part of the composer.

Yet this isn't a criticism – the product is only as interesting as the system creating it. A complex, well thought-out system provides an endless stream of variation, all only just under the designer's control.

Such a system might be comprised of a handful of tape loops of varying lengths, as exemplified by Steve Reich's famous composition *Come Out* from 1966.

Similarly, Brian Eno's aforementioned *Discreet Music* consisted of a pair of sequenced Synthi AKS melodies – each a different length – played through equalisers and tape machines.

Irv Teibel's *Tintinnabulation* consisted of primitive computer-generated bell tones – the listener was instructed to play the record at whatever speed they liked.

Today, it's fashionable for modular synthesists to create elaborate self-playing patches, but such techniques are decades old – Monkee Mickey Dolenz, for example, enjoyed patching his Moog's sequencers to provide background music at parties.

> Step by step 2. Drones and pads

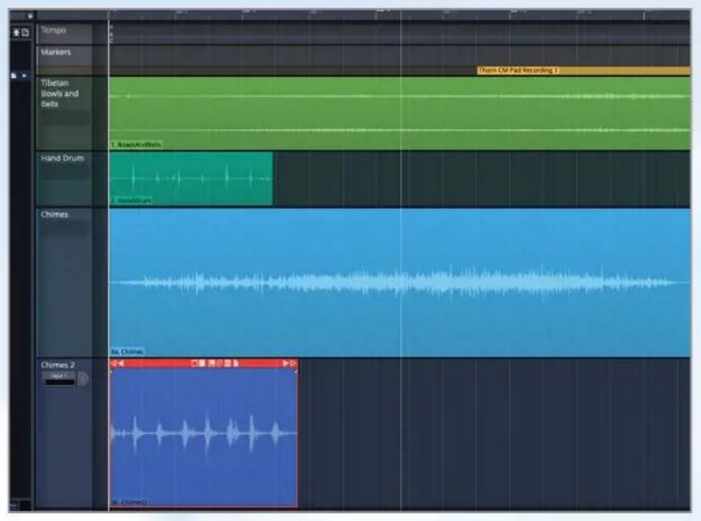
1 > You've created an evolving ambient patch in Voltage Modular Nucleus and though it's pretty interesting as is, it can also serve as a springboard for a more complex composition. To do that, you'll need to open it up in your DAW of choice. Once again, we're using Tracktion's Waveform Free.

2 > Once Nucleus is instantiated, load up the ambient patch you made in the previous walkthrough (or use our own Ambient CM patch). Once loaded, it'll happily play on its own – but that won't do at all, so fire up an instance of Alpha CM on a second track and find the preset patch called PAD-Melencholy-TEG.

3 > Making sure your metronome is switched off, arm your Alpha CM track and engage recording. Give it a good while before bringing any notes in – we waited nearly a minute – and play and hold some long, sustained notes in the key of C Major. We stopped recording at just over 02:39.

4 > Let's add another synth – this time let it be Thorn CM, using the PAD Mist patch. Again, you should be quite reserved in what you play in, with only occasional sustained notes adding a bit of interest.

> Step by step 3. Get real



1 > Many classic ambient recordings were made with acoustic or electric instruments, and even more combine electronic, acoustic, and electric instrumentation. Use any old thing, from kids' toys to cheap 'n' cheerful recorders! No mic? Use your phone! Here, we're tracking Tibetan singing bowls and bells.

2 > Though we want to avoid creating any sense of defined structure for our ambient track, a bit of percussion can add some atmosphere, so let's grab a hand drum and record a few whacks onto a new audio track. It doesn't sound like much right now, but it's enough to loop and save for later.

3 > Finally, we'll record some gently tinkling chimes onto another track. We'll also try shaking them rhythmically. Incidentally, all of the acoustic sounds we've recorded can be found among the audio files included in the Tutorials folder at filesilo.co.uk and dragged straight into your project.

> Step by step

4. Get it together

1 > We've now got enough material, so let's start arranging our project. We'll begin by muting our three most recent tracks – the hand drum and chimes. To save some time, we've created a stereo sub-mix of our Tibetan bowl and bell recordings, which we'll place at around two minutes into the project.

2 > We want the instruments to fade in and out very slowly and deliberately. As our bowls and bells begin to fade out, we'll bring our first chimes recording in at around 2:46. It has a natural fade-in, but we've used our DAW's clip fade function to bring it in even more gradually.

3 > We need a little something more as our chimes fade out, so go back up to your Alpha CM track and play a low, droning note or two just after the 3:00 mark. An ambient track ought to have some actual ambience, so instantiate Reverberate CM on an aux and call up the Chamber preset.

4 > Set the reverb's Dry/Wet mix fully wet. Now, unmute and send the hand drum track into the new aux bus. Crank the Send, drenching the drums in reverb. Go ahead and move your drum clip out to around 3:30 or so and loop it until just around the 5:00 mark.

5 > Using your DAW's clip fade functions, fade the drum loop slowly into the mix, let it play for a while and fade it out again, just as slowly. Unmute your second chimes clip. Loop it, and fade it in as your drum clip fades out. You can sync the clips, but we've elected to leave them as-is.

6 > Consider sending your second chimes clip through the reverb, as well. While you're at it, a bit of delay on, say, the Tibetan bowls and bells might serve to smooth out some of the rough edges. Ditto for the first chimes track. Now sit back, relax, and enjoy the music!

The Aleatoric Era

Composer Terry Riley's famous 1964 piece *In C* was a groundbreaking performance piece consisting of 53 musical phrases ranging in length, up to 32 beats. Performers would choose which of these phrases were to be played and when each phrase would begin, all against the backdrop of repeating C notes on a piano or some other chromatic percussion instrument. Performers might sometimes omit some bits, but all of those bits were to be played in order.

Today, this sort of musical indeterminacy has become something of a fad among electronic musicians, and the term used to describe it – aleatoric – is used to describe pretty much any randomly generated noise. However, 'modern' aleatoric music is actually nearly a century old, coming to prominence at the hands of adventurous composers like Charles Ives, Henry Cowell, Pierre Boulez, Karlheinz Stockhausen.

Some of the very first widely available computer music applications were dedicated to producing a series of semi-randomly generated musical events, often based on only minimal human input. These days a sequencer is hardly considered complete without some sort of aleatoric or random pattern generator.

POWER TIP

> Instant ambient

We're going to let you in on a secret: you can make a staggeringly good ambient track in an instant and you can do it without spending a penny. How? By downloading the free and open source Paulstretch. This infamous app can stretch any audio file by 1,000,000,000,000,000,000 times. We're not kidding. It has become a favourite among experimental musicians, sound designers, and Youtubers, and used to create ambient bliss from all manner of sources ranging from Justin Bieber tracks to clips from The Simpsons. Grab your copy from http://hypermammut.sourceforge.net/paulstretch/.

An Ending (Ascent)

Brian Eno

Year: **1983 (also used earlier)**

Original Synth: **Possibly Yamaha DX7, but likely Yamaha CS-80**

Plugins used: **Thorn, HY-FX CM, Panagement**

> Originally recorded for a documentary on the Apollo moon missions entitled *For All Mankind*, *An Ending* was taken from Brian Eno's 1983 studio album *Apollo: Atmospheres and Soundtracks* and was written by Eno, alongside production from his brother Roger Eno and long time collaborator Daniel Lanois.

Specific details on precisely which synth was used to create the track aren't totally clear, with the then brand new Yamaha DX7 being used on various tracks from that album, but Lanois himself stated that "the main synth was a Yamaha CS-80", making it possible that a combination of synths was used to create the final piece.

Eno was a famous user of effects from the likes of Eventide, Lexicon and AMS for sound design purposes to create his famed "shimmer" effect, so we'll be showing you how to make our homage to this sound using ThornCM, alongside some effects processing from the CM library.

> Step by step: Trademark Eno pads

1 > Open ThornCM, and load the Neutrino preset; an Eno-esque pad perfect for recreating this sound. Shorten the Amp Env Release down to 30%, then record the pad to audio twice; once with ThornCM's reverb effect enabled, once without. Use both to create the sound.

2 > Add depth using the dry layer. Add HY-FX CM to the channel, then choose the Pitch Shifter effect. Turn the left and right Shift dials to their lowest; you'll hear the dry pad shift down an octave. The layer needs to be tuned down by two octaves, so duplicate the plugin to shift it.

3 > Duplicate the wet pad. Use the duplicate for the high layer; add another HY-FX Pitch Shifter, then shift it up an octave. Shifting the pitch up with the plugin, not our DAW, gives a unique effect. Add another HY-FX and select the Reverse Delay for a shimmering, ethereal feel.

4 > Lower the high layer to -6dB to balance. Embellish the stereo width using Auburn's Panagement. Group the mid and high layers, then load the plugin. Push Width to 200%, with Mono to Stereo at 50%. Reducing Wet/Dry control to 50% adds width, without it sounding over the top.

Phaedra

Tangerine Dream

Year: **1974**

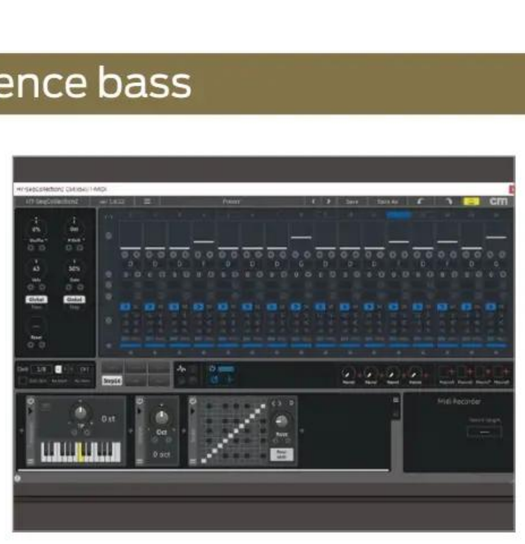
Original Synth: **Moog Modular**

Plugins used: **ThornCM, HY-SeqCollection2**

> The title track from Tangerine Dream's fifth studio album was recorded in late 1973, and was heavily based around the Moog Modular synth the trio purchased with their advance from then-fledgling Virgin Records. Legend has it the band spent hours before each day's recording tuning the Moog; early analogue synths were incredibly sensitive to temperature and humidity.

The record was a surprise top 20 hit in the UK, but didn't fare so well in Tangerine Dream's home country of Germany, with less than 6,000 units sold. *Phaedra* was the first TG record that featured their sequencer-based sound, with an external sequencer driving the Moog as a substitute for bass guitar. We'll use ThornCM, alongside the HY-SeqCollection2 CM to make our own spin on the legendary Phaedra bass.

> Step by step: Sequence bass



1 > Set your DAW's BPM to 149. Load HY-SeqCollection2 CM onto a fresh MIDI channel, then set it to provide MIDI data to ThornCM (loaded on a second channel) by choosing HY-SeqCollection2 as the MIDI From source – see the HY-SC2 manual for DAW-specific instructions.

2 > Open the sequencer, then set root note to D, with root shift enabled – this'll match the key of the sequence to the original track (D minor). Set the sequencer Clock to 1/8th notes to match the tempo, then program in a pattern similar to the original by setting Pitch Value for each step.

3 > Open ThornCM and shape the sound itself. Set the Filter Type to Fat LP24, and bring Cutoff down to 2kHz, Resonance at 25%. Push Drive to around 16dB to make the gain up. Finally, assign a slow 8/1 LFO to ThornCM's Fine Tuning, stimulating the natural pitch drift of an analogue synth.

Shine On You Crazy Diamond
Pink Floyd
Year: **1975**
Original Synth: **Moog Minimoog**
Plugin used: **u-he Bazille**

> Classic rockers Pink Floyd made it their mission to employ the latest technology of their day. From elaborate surround sound PA rigs to experimental onstage lighting, the band were hell-bent on providing their audiences with new experiences.

This obsession with bleeding-edge tech all but ensured that they'd be among the vanguard of electronic rockers. Their initial experimentation with EMS Synthis on their landmark LP *The Dark Side of the Moon*, with its electronic showcase *On the Run,* only hinted at what was to come. When they returned to Abbey Road for the follow up in '75, the group's keyboardist brought along a Minimoog and ARP String Ensemble to supplement the band's beloved EMS Synthis.

By about this time, the band – and keyboardist Rick Wright, in particular – had evolved the role of the synthesiser far beyond the overtly futuristic, even goofy sounds favoured by many artists of the day. Instead, the electronics had become fully integrated and interwoven into the Floyd's sonic tapestries. The lines between acoustic, electric and synthetic sounds were less distinct.

Indeed, this new album – *Wish You Were Here* – demonstrated a singular maturity in the use of the synthesiser. Here, notes – not sound effects – came first. And yet the sounds were utterly remarkable – tones and textures that would eventually become indelibly etched into the lexicon of rock music.

Every track on *Wish You Were Here* is a classic, but none more so than *Shine On You Crazy Diamond*, the ambitious nine-part epic dedicated to and inspired by the band's tragic former frontman, Syd Barrett.

A multi-segmented, multi-layered masterwork, *Shine On You Crazy Diamond* features the band performing at its peak, not least Mr Wright, whose keyboard playing on this track is widely regarded as some of his best work. His yearning, slightly wistful brass-like Minimoog passage in the song's third section is nothing short of perfection. Tasteful and beautifully crafted.

> Step by step *Shine On You Crazy Diamond*'s brassy lead

1 > Wright's sublime, brass-like patch on *Shine On You Crazy Diamond* is proof that less is indeed more, particularly when the keys are being played by a masterful performer. The original was made using the venerable Minimoog, a simplified variant of the company's massive modular systems. We're going to use a far more complex instrument, u-he's Bazille CM.

2 > Going to the FX: Delay section, lower-right, we'll switch out the delay effect. We'll disconnect the cable running from Osc 1 to Out 1, and route it instead from the same Osc 1 output to the top-left Filter input. We'll then patch the Filter's LP24 Output to the Out 1 jack in its place. We'll patch Osc 2's Output into the Filter, too.

3 > We'll need to crank Osc 2's PD knob. Next, go to Osc 1's Modify knob and turn it to -2.00, and then set Osc 2's Modify (Fine Tune) knob to 2.00 to thicken the sound. Now we'll start shaping the sound with the Filter. We want the sound to be brighter on higher notes, so crank the Key Follow full.

4 > Next, turn Res up to about 19.00. Now turn the Cutoff all the way down. Run a cable from Env 2 up to the Filter's lower-left jack, and turn the knob above that jack up to 38.00. This allows Env 2 to control the Cutoff. Set Env 2's Attack slider to 22.00, and max the Decay. Sustain will be about 87.00 and Release roughly 13.00.

5 > Go to Env 1. Set its Attack to 33.00, its Sustain full, and its Release to about 26.00. The Decay is unimportant here. Now for some modulation. Go to LFO 1. Route a cable from its lower-left jack to both Oscs' FreqModDepth jacks. Click each 50 Semi dropdown and Cents. Crank each FreqModDepth full for vibrato.

6 > Set LFO 1's Rate to 2.20. Turn LFO 1's Amp Mod knob up full to put vibrato amount under the control of your keyboard's modulation wheel. Now, go to Voice and set Mode to Mono. Go to Glide and set its Amount to 22.00. Re-activate the delay and tweak it to taste. Use that mod wheel when you play your patch!

I Feel Love
Donna Summer, Giorgio Moroder
Year: **1977**
Original Synth: **Moog IIIP**
Plugin used: **Cherry Audio Voltage Modular Nucleus**

> Step by step *I Feel Love* Sequence

1 > Can we recreate the seminal bass sequence from *I Feel Love* in a mere six steps? Let's find out! We'll fire up Cherry Audio's Voltage Modular Nucleus and click New in the upper-left to clear the rack. We'll go to the Library and get two Oscillators and a Filter module. We'll add two Envelope Generators, and an Amplifier, as well.

2 > Let's get our basic patch started by routing each Oscillator's Ramp Outputs (second from left) to the Filter's Audio In. Set one of the Oscillator's Range to 32'. Detune one Oscillator's Freq to about -0.04, and the other to 0.04. Route the Filter's Low Pass (bottom-left) to the Amplifier's Input. Patch the Amplifier's '+' Output to the Main Out's 1L(M) jack.

> It is all but impossible to underestimate the impact of *I Feel Love*. Released in the summer of 1977, it was a seminal slab of electronic disco unlike anything that had come before it. Famously, one of David Bowie's sessions for the *Low* album was interrupted by a breathless Brian Eno who, having just heard *I Feel Love*, declared that it was "going to change the sound of music for the next 15 years."

He wasn't wrong, but he was guessing a bit short of the mark, as echoes of *I Feel Love* have never faded, with musicians today still trying to recapture the magic of the original.

Ironically, the song's longevity was something of a self-fulfilling prophecy. When producers Giorgio Moroder and Pete Bellotte began work on Summer's fifth LP, they envisioned a concept album on which each song represented a specific decade, with the final cut being an attempt to create something futuristic. They couldn't have known how right they were!

In order to create their prognostic platter, they chose to eschew the typical instrumentation of disco music – telegraph guitars, thick strings, electric bass, and horns – and bring in a massive Moog IIIP system belonging to classical musician Eberhard Schoener. Luckily, Schoener's assistant Robby Wedel accompanied the Moog to lend a hand with the immense technical requirements of the system. Most significantly, he showed the producers how it could be synchronised to tape in order to record multiple tracks in perfect rhythmic lock-step.

Wedel's demonstration was a revelation, allowing Moroder and Bellotte to create a complete arrangement using little else but the Moog. The bass sequence, the snares, hi-hats – all were products of the modular synth. The results were a clean, open mix that allowed Summer the freedom to lay down an astonishingly-evocative vocal performance.

3 > Next, patch the rightmost Envelope Generator's Positive Output (bottom-right) to the Amplifier's CV Amount jack. Patch the rightmost Envelope's Positive Output to the Filter's Freq Mod 1 jack. Go to the Library and get an Eight-Step Sequencer module. Set its Rate to 125bpm. Use its Step On/Off buttons to deactivate steps 2, 4, 6, and 8.

4 > Move the slider for step 5 to 'F2' and the slider for step 7 to 'G2'. These aren't the exact notes, but they are close enough, and avoid copyright entanglements. Patch the Sequencer's CV Output to both Oscs' Pitch CV jacks. Patch its Gate Out to both Envelopes' Gate In. Press Start on the sequencer. Yuck. Set both Envs' Sustain sliders to nil.

5 > Set the right Envelope's Decay and Release to around 260ms. Set the Filter's Cutoff to 600Hz or so, and its Resonance to about 33. Set its Freq Mod 1 knob to 65%. Now set the right Envelope's Decay to around 192ms and the Release to over 260ms. Bring in a Mini LFO and crank its top Rate fully down.

6 > Patch the LFO's top Triangle Out to the FIlter's Freq Mod 2 jack. Nudge its knob slightly right. Bring in a Delay and set its Time to 120ms and Mix fully Wet. Patch the Amplifier's '+' Output to the Delay's Input, and the Delay's '+' Output to the Main Outs 1R. Patch the CV Source's Pitch to the Oscs' Pitch CV to transpose.

The Model
Kraftwerk
Year: **1978**
Original Synth:
Unknown – likely Moog Minimoog or Polymoog
Plugin used: **Alpha CM**

> We've no doubt that there are few readers of this bookazine unfamiliar with the name Kraftwerk. Moreover, it'd be a fairly safe assumption that most of you already have an idea of what they sounded like. Yet it may come as something of a surprise to learn that the smartly-dressed synthpop pioneers only achieved their signature sound after years of evolution. Indeed, when mainmen Ralf Hütter and Florian Schneider formed the band in 1970, there was nary a synthesiser in sight! As a matter of fact, Kraftwerk's first two (eponymous) LPs were rooted firmly in the experimental 'Krautrock' style that was popular at the time of their formation. Synths would come into play on the third album, *Ralf und Florian*, on which both the Minimoog and EMS Synthi AKS would appear. Still rooted in Germanic psychedelia, *Ralf und Florian* nevertheless saw the Düsseldorf duo's first tentative steps into electronic ambience and minimalism.

Even the band's breakthrough, 1974's *Autobahn* retained such conventional instrumentation as guitar, flute, and violin and, though now seen a seminal electronic album, *Autobahn* also contains elements of ambience and kosmische musik.

Still, the repetitious rhythms of the title track were a taste of things to come. By the time *The Man-Machine* was released in 1978, the transformation was complete – Kraftwerk were dedicated to creating their signature brand of electronic pop music. This seminal synthpop sound was best exemplified by *The Model*. Overlooked at the time of its release, *The Model* would belatedly find favour in 1981, when it was re-issued as the b-side to the band's then-current single, *Computer Love*. Re-re-issued as an A-side, *The Model* topped the UK singles chart in 1982.

An exercise in minimalism, *The Model* is a near-perfect pop construct, with a simple progression, spare percussion, and a pretty much instantly memorable melody played in octaves throughout.

> Step by step
Lead line from *The Model*

1 > It's difficult to know what synths were actually used to create the various timbres heard on *The Model*, though it is widely suspected that either the Minimoog or Polymoog were used for some sounds. In truth, it doesn't actually matter, as nearly any two-oscillator synth will do the job. We're going to use LinPlug's AlphaCM.

2 > Go over to the browser at the bottom and click AlphaCM 1 to bring up the preset banks. Load up the patch called Z_ Init. Go to Osc 1 and select Sawtooth for wave slot A. Turn the Wave knob fully to the A position. Do the same with Osc 2. Next up, push Osc 1's Detune up to just under 10 o'clock.

3 > Let's go to the Amp section and nudge the envelope's Attack up to just below 9 o'clock. Release should be just under halfway. Sustain and Decay can be cranked to full. This provides our sound with a soft attack, and a bit of a fade-out when the key is released. Now, let's move to the Filter section, where we'll select 24 as the mode.

4 > It might be a good idea to push the Drive up a little bit for some faux analogue grit. Now for the main bit. We'll set the Cutoff knob to 10 o'clock, and we'll push the Reso(nance) knob up to 11 o'clock or so. This will help us get the characteristic 'wow' once we bring the filter's envelope into play. On that, crank the Depth knob full.

5 > Next, let's shape our filter envelope. We'll start by nudging the Attack to just under 9 o'clock. The Decay should be set to just over the 9 o'clock position. We'll reduce the Sustain to just under the 2 o'clock position. We'll set our Release to just under the 1 o'clock position. That's pretty close, though only playing the riff will tell.

6 > Here, we've tweaked the filter envelope's Decay a bit to fit our playing style. Now, we can sweeten the sound with a bit of echo, courtesy of PSP's cmDelay, on which we've selected the patch called Basic Middle Delay. We've activated Tempo Sync, and tweaked both Feedback and Mix levels. This is a good start – you can fine-tune it as you see fit.

WELCOME TO THE MACHINE

In a rare 1981 interview, Kraftwerk's Ralf Hütter reveals what really happened in their legendary Kling Klang studios

> Ralf Ralf Hütter first met Florian Schneider in the Dusseldorf Academy, Germany, in 1968, where courses were being held in musical improvisation. From this essentially classical background they teamed up to try their newly acquired skills with experiments in electronic sound that began by simply using amplifiers, echo machines and feedback effects.

"Not only were we interested in Musique Concrete," he says, "but also in playing organ tone clusters and flute feedback sounds that added variety to the repeated note sequences that we recorded and mixed on tape.

"Then we tried acoustic drummers as we turned our attention to more rhythmic music, and found that amplifying drums with contact microphones was desirable, although not readily accepted by the players.

"We started off 'Kling Klang' studio in 1970, which really marked the beginning of Kraftwerk. The studio was, in fact, just an empty room in a workshop premises that was a part of an industrial area in Düsseldorf. First of all we fitted sound isolation material into the 60 square metre room, and we now use other adjoining rooms which we use to create our instruments.

"When we first moved in, we started recording with stereo tape machines and cassette recorders in preparation for our first record. The master tapes were then taken to the recording studio for final mixdown. This allowed us to be 'self producing', and we did another three LPs in this way.

"In those days successful musicians used important producers to launch their records, but we took on every aspect of production ourselves," says Ralf. "It's very encouraging in England today to see people bringing out their own cassette labels. From the start we used

cassettes for recording 'in the field' and mixed these sounds with our instruments in the studio [Kling Klang]."

Dawn of the instruments

"In 1971 Kraftwerk was still without a drummer, so I bought a cheap drum machine which had some preset dance rhythms. By changing the basic sounds with tape echo and filtering we made the rhythm tracks for our second album. Our instrumental sounds came from home-made oscillators and an old Hammond organ that gave us varied tonal harmonies with its drawbars.

"Commercial synthesisers came fairly late into Germany and it was not until the third album that we started to use them. By then, Wolfgang Flür had joined to play a custom-built drum system: he was our first percussion player to accept electronically produced drums.

"Electronic music was quite new as a medium in the early '70s, and many people were just starting, like Can. I think we were one of the first groups to have an electric drummer, with Wolfgang Flür. As well as the custom drum console, we now have two sets of drums that consist of six metal pads triggered by metal sticks. These are not touch sensitive, so accents and dynamics come from separate volume foot pedals."

A year later Karl Bartos became the fourth Kraftwerk musician. He also believed that music could be made satisfactorily through entirely electronic means.

"We feel music is more a product of the imagination," explains Ralf, "and the instruments are made as a result of everything we do. We don't see ourselves as specific instrumentalists - I am not just a keyboard player, nor is Wolfgang simply a drummer, this is too limiting for each player who has developed skills in making harmonies and melodies as well as rhythms."

Crew Kling Klang

The Kling Klang studio equipment continued to be designed by all four musicians and since their knowledge of electronics was limited, they employed a full-time engineer to make and service equipment as well as a mathematician to devise the computer programs.

"Our daily schedule of work lasts some 8-10 hours in the studio," says Ralf. "We don't regard ourselves just as musicians but as Musik-Arbeiter [musical workers], and we designed and built up our complete portable studio set that includes the stage backdrops, curtains, lighting, frames, staging and stereo PA system as well as the instrument equipment stands.

"Multi-wired cable looms are used for quick dismantling of each section of the movable instrument frames. The players stand on metal box staging that hides the mass of wiring. Fortunately, we are all about the same stature, so each of the four players' sections of the instrument gear is built to be suitable for any of us. All the instrument racks are standard 19" width and pack away into cases for transit."

Static electricity

Although it is very easy for electronic bands to use pre-recording tapes to achieve a similar sound live to the one they emit on record, Kraftwerk play most of their pieces completely live.

Discussing their live show, Ralf has this to say: "Many people move or jump about on stage these days; it's important for our music that we do not do this. Our rather static performance is necessary for emphasising the 'robotic' aspect of our music.

"The way in which we physically laid out the equipment, besides being functional, was to imply the idea of the 'man man machine machine' that we've talked about, that one aspect doesn't dominate the other."

The Robotniks

"We like to portray the things we do on a day-to-day basis in our music. We did try a space lab kind of set once, but always prefer these days to relate to everyday technology, such as cars, trains and other human-controlled machines.

"Our 'trip' for these current performances is based on robots. The idea of the robot came from an American tour, during which we started to become automatic and 'robotic' ourselves: new pieces were written in 5-10 minutes. One evening in a discotheque I wrote *Showroom Dummies* like that.

"We were intrigued that the Russian word 'robotnik' means 'worker' and that it so much related to our ideas. We generally keep our audience contact to a metaphysical level because we have little time to look around - although we are very much aware of their response.

"We agreed that the way musical equipment is designed in the future could be as an extension from the human, with suitable feedback between machine and man," says Ralf.

"The emphasis on keyboards could turn to instruments, controlled by some part of the body, using piezo pick-ups, special electrodes and heat-sensitive elements."

Let's go electro

"Electro-music is a more suitable title than electronic music for the way music in general is going," says Ralf. "The instruments of electro-music help to liberate people's creativity, allowing individuals to use studio technology in their home for almost any sound they want.

"When we select an instrument sound, we don't worry if, for example, the strings are not authentic – we simply take the sounds we like! On stage we use sheet music, graphic diagrams and settings which cue in our pieces to trigger devices and adjust instruments, as well as

"Our static performance is necessary for emphasising the robotic aspect of our music"

reminding us of note sequences, lead melodies, harmonies and rhythmic structures.

"Our latest album, *Computer World*, was prepared over the last three years along with the present Kling Klang studio. The pieces in many ways 'compose themselves' by means of us finding sounds from experimenting with interfacing and settings.

"During the week, we work from five in the evening until one or two at night. During other times in the day we do the Kraftwerk administration and liase with our engineers and visitors."

Look to the future

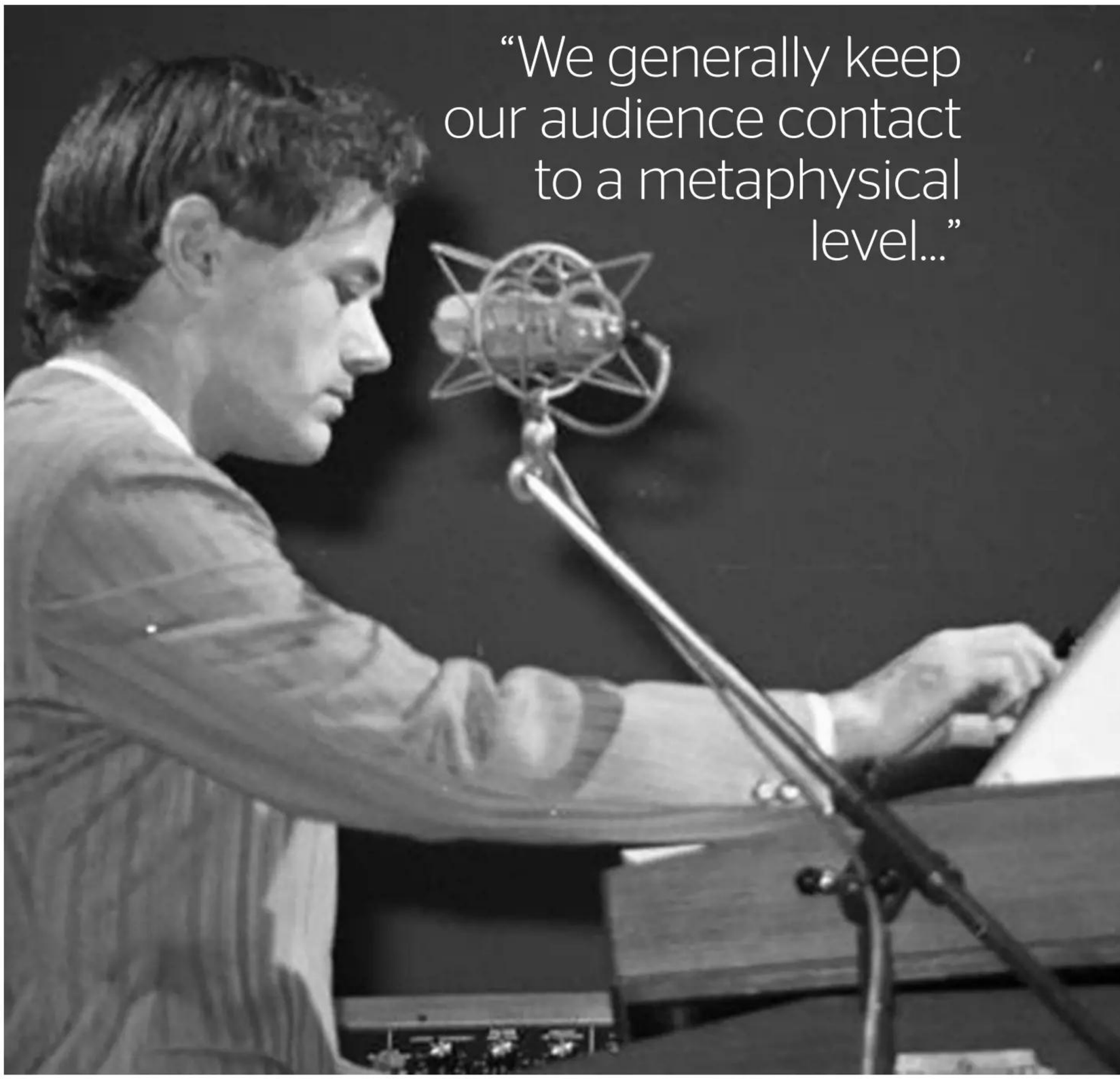
"In the future we shall try to make our instruments smaller, with more digital control," says Ralph of where the band are heading. "Micro-electronics should make our set-up more flexible and allow us to perform on smaller stages.

"We aim to create a total sound, not to make music in the traditional sense with complex harmonies. A minimalist approach is much more important for us: we spend about a month on the sound and five minutes on the chord changes!

"Germany has no predominent pop-music scene, unlike England, so we have a thriving communication between electronic music listeners and performers. Cassette tapes are promoting this as well."

The 1981 Kraftwerk tour is about visit France and America before coming to an end in East Germany, Russia and finally Japan. Meanwhile, the computer world continues apace – and Kraftwerk will no doubt have made a significant contribution to its musical development.

Ralf was talking to Mike Beecher in an interview from *Electronics and Music Maker* magazine



HOW TO BEFRIEND ROBOTS AND INFLUENCE PEOPLE

In 1981, Ralf Hütter explained his top tips for performing with machines

1 LET THE MACHINES HELP YOU

"Playing with machines is difficult – a lot of people speed up or slow down doing it. The friendship we create with them makes them an extension of the musician: if one instrument breaks down we are still able to continue."

2 BLEND IN WITH THE MACHINES

"So many people move or even jump around on stage these days and yet it's important for our music that we do not do this – our rather static performance is also necessary for emphasising the 'robotic' aspect of our music."

3 REMEMBER: MAN AND MACHINE ARE EQUAL

"Some people perform with their musical machines built up high around them in an impressive way – we prefer the low-profile image, bringing man and machine together in a 'friendly partnership' of musical creation."

The 1980s

What a decade for electronic music the 80s was, as it exploded onto the world stage by way of synth pop, before disappearing under a digital haze towards the middle of the decade, only to be reborn as dance music and 'electronica'. And behind it all, the beating hearts of the analogue synth and drum machine...

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Photographed by Daron Gild

VINCE CLARKE

From the 80s on, Vince Clarke redefined Electronic Music with Depeche Mode, Yazoo and Erasure. And with every success, he has most definitely put the word 'pop' in synth...

> Mention Essex these days and most people automatically think of Lauren, Megan, Gemma, Diags and Arg as they pit their wits against the mighty challenges of modern life – buying shoes, using cutlery and the complexity of Ab Initio quantum computation of bulk properties. But, believe it or not, this much-maligned county has had a sizeable part to play in the development of British Electronic Music.

There's the Prodigy, of course; formed in Braintree. Underworld are based in and have occasionally namechecked Romford; frontman Karl Hyde refers to Romford as his 'New York'. There was a dark side to Essex's history, too: it was the entry-point for much of the E that landed here during the rave years.

But we can go back even further than that. To 1980, when Basildon school friends Vince Clarke, Andy Fletcher and Martin Gore joined Dave Gahan in the strangely named Depeche Mode. In quick succession, the band signed to a fledgling record label called Mute, released three singles, and made the UK Top Ten.

In 1981, they appeared on *Top of the Pops* for the first time. This was the classic four-lads-in-a-band line-up, but there was no posturing, no guitars and no drum kits – just bleeping synths accompanied by the incessant rhythms of a Korg KR55 and a ridiculously young-looking Dave Gahan introducing the world to 'geek dancing'.

This was proper pop music – effervescent, catchy, singalong, verse-chorus pop music, played by boys

who looked good on bedroom walls – but its sound was electronic.

Unfortunately, it seems that not everyone was happy with the 'boy band' success. Founder member and main songwriter Vince Clarke – Clarke was responsible for the still-superb *Just Can't Get Enough* – left after one album. Initially teaming up with fellow Basildon alumnus Alison Moyet, he scored another series of pristine hit singles – *Only You*, *Don't Go* and *Nobody's Diary* all made the Top Three – before forming Erasure in 1985 with singer Andy Bell. Well over 40 singles and 25-million album sales later, the duo are still going strong, most recently with the album *The Neon*.

Clarke left Essex many years ago and is now based in Brooklyn, where he puts together the nuts and bolts of Erasure's music on a large collection of vintage synths, in the midst of which he spent a morning with us, talking about obsession, sequencers and the timeless joy of a catchy pop song.

Is there any evidence to back up our 'Essex music' theory? Something in the water, ancient ley lines... decent music shops?
Vince Clarke: "Ha ha! The main reason I became interested in music was boredom. It was the same for most of the people I knew, and I think it was the same in towns and cities up and down the country. Basildon didn't have a cinema, a theatre... not even a restaurant. Music was something to do. It was something to get excited about.

"Watching *Top of the Pops* was one of the most important events in any kid's week back in the 70s. I watched it religiously and loved the way that the glam bands stood out against the greyness of that era. Yes, you had Bowie and Roxy Music, but there was also Sweet and Alice Cooper. Great songs, too.

"Although we weren't a particularly musical family – my parents listened to music all the time, but they didn't play any instruments – me and my brothers and sister ended up going to this music club on a Saturday morning. I was messing around on a guitar, but I'd also come across a piano in the local church hall; I used to go to Boys' Brigade there."

"I've always written on the guitar – I still do, even today. I'm not a good-enough keyboard player to write on the synth"

No synths?
VC: "I started writing songs and playing in bands when I was about 15, but it was very much in the traditional framework of guitar-bass-drums. The first time I really remember taking notice of a synth was when I heard The Normal [the name Daniel Miller used to release records on his own tiny independent label, Mute; his bleak, minimalist synthesised soundscapes fused technology and punk, and were hugely influential on the late-70s musical underground].

"You'd also got the early singles by the Human League [the much-admired *Travelogue* album was released a year before the chart-topping success of *Dare*] and OMD. In fact, it was OMD that convinced me to switch to synths. The first time I heard *Almost*, which was the B-side to their single *Electricity*.

"Up until then, even though I loved music, it'd seemed like a world far, far away from Basildon. Yeah, it was great listening to Sweet on *Top of the Pops*, but that would never be me; I couldn't be a rock star. For a start, being a rock star was expensive... you needed all that gear and the outfits. Then you had to spend six months in a fancy studio somewhere. But when I heard OMD and The Normal, I thought, 'I can do that. I can write songs like that'.

"Obviously, I'd lived through punk, and I'd heard the Sex Pistols and the Stranglers, but that still sounded a bit 'rock 'n' roll'. Synths sounded different. They sounded interesting. When you're a kid, that's what you're looking for; something that captures your imagination."

When we speak to Gary Numan [see page 52], he talks about taking his guitar riffs and playing them on a Moog synthesiser. Is that what you did... transfer your music to this new medium?
VC: "I've always written on the guitar – I still do, even today. I'm not a good-enough keyboard player to write on the synth, and I'd probably get distracted, twiddling knobs and going off on tangents.

"The problem is that I'm not really a very good guitar player, either, so all the songs I wrote when we first formed Depeche Mode were based on simple chords. And they were firmly rooted in what people would think of as the classic song structure of intro-verse-chorus etc.

"When it came to playing those songs on our newly acquired synths, we quickly realised that we only had monosynths, so we couldn't actually play any chords. I think that's where

Photographed by Dobrin Gild

With 35+ years and 18 albums under their belt, Erasure are still going strong and flying the flag for analogue technology

Photographed by Andy Sturmey

I got into the idea of all these melody lines and counter-melody lines – I needed to suggest chords and chord-changes without being able to play any chords.

"In the early days, we didn't even have any way of linking the gear together or sequencing it, so everything had to be played live. Getting everything in time took a lot of work. I wonder if that's why I'm still a bit nervous when I do gigs; I still worry that something's gonna go wrong."

"Even after I started working with the BBC Micro, I would occasionally switch back to the MC-4. It's just so tight"

For years, you were well-known for running a BBC Micro and the UMI sequencer at the heart of your setup. When did you first come across the BBC, and did it radically alter the sound of your music?

VC: "To be honest, we need to go back before the computer and talk about the sequencer. That was the real revolutionary step for me... that was the eureka moment. Daniel Miller introduced us to the sequencer when we signed to Mute and, after I left Depeche Mode, I started writing with a Roland MC-4.

"For me, that was more important that the computer or the synth, because it was the first time I'd been allowed to make music that I couldn't physically play. I wasn't limited by how good a musician I was. Like I said, I was never a great keyboard player, but with the sequencer, I could play anything I wanted.

"That was when the electronic door really opened and I got a glimpse of what was possible. Even after I started working with the BBC Micro, I would occasionally switch back to the MC-4. It's just so tight."

There's been a lot written about why you left Depeche Mode. Did you enjoy the success that came with the band?

VC: "It was great to be in the studio and properly record our music. To hear it on the radio for the first time. To find out you were in the charts. Being on *Top of the Pops*, the programme

Kit list

HARDWARE
Apple Mac
Eurorack system
Synton Syrinx
RSF Kobol
Roland Jupiter-4
Roland Jupiter-8
Roland System-700
ARP 2500
ARP 2600
Polyfusion Modular

SOFTWARE
Apple Logic
Waves Platinum bundle
Sonnox Oxford Dynamics
Apple Alchemy
Logic EXS24
Vember Audio Surge
u-he Ace
Soundtoys plugins

Has modern technology made the live show easier?

"The short answer is yes. I no longer have to carry around a bunch of synths that are 40 years old... but that also means I've not got very much to do on stage. I've never been able to dance, which is why I use the guitar.

"Eurorack is possibly the way forward. I've got a few bits in the studio and they did get used on the new albums. What I really like about them is that, like my old synths, they're slightly unpredictable; you expect them to do 'this', but the sound is way over here. Then you've got the new generation of 'analogue' synths. Analogue sound without the danger that you'll damage a transistor when it falls out of the tour bus. There's a chance I might be taking one or two of those out on this tour.

"Even though I can't dance, it would be nice to twiddle the odd knob now and again."

Photographed by Andy Sturmey

that had been such a big part of my life. Playing gigs was great, and watching the audience grow so quickly. Without a doubt, it was a very exciting time."

Had you got an idea of what you wanted to do after you left?
VC: "Not at all. There was no big plan. When I met Alison and we recorded *Only You*, it was nothing more than a rough idea – a demo."

If you look back at your singles career – *I Just Can't Get Enough* with Depeche Mode, *Only You* with Yazoo; right through to the massive run of Erasure singles like *Sometimes*, *Victim of Love* and *A Little Respect* – it's impossible to ignore just how catchy they are. Had you always worked with the idea that singles needed to be instant, memorable... hummable?
VC: "Honestly, it was never anything so calculated. And I think that if you do sit down and say, 'I'm going to write a catchy single', it'll never happen.

"I don't know how to explain it. I loved music and I'd been listening to it all my life. What I had worked out was how to 'make' a song... a strong song. I didn't know anything about harmonies and all that kind of stuff. I learned about that as we went along.

"Every time I went in the studio, I would always learn something new, and that then gave me the opportunity to try different things out."

> "I didn't know anything about harmonies and all that kind of stuff. I learned about that as we went along"

Having said that, your later tracks can show a much darker, melancholy side of Erasure...
VC: "Yeah, there's a sadness there."

Are you inspired by anything? The age of austerity? The failure of global politics?
VC: "[Chuckles] If anything, I was inspired by cabin fever, like most of our albums. I'll be in the studio, messing around, and it feels like the right time to make some music. I get together with Andy and an album will emerge, but neither of us has any idea of what it will sound like."

Tell us about your basement studio, the famous Cabin?
VC: "Since me and my wife moved to Brooklyn – she's American, that's how we ended up in the US – the studio has been in the basement. It's not a huge space, and there's not really room to set up a proper vocal booth; Andy tends to record his vocals elsewhere and then send them over.

Vince bought loads of BBC Micros so he'd always have one available. You might say he *Just Can't Get Enough*

"I even had to get rid of a few synths when I set it up, mainly the spares that we used to take out on tour. What I've got now is every synth ready to go, all plugged in and running from Logic."

When did you finally get rid of the BBC Micro/ MC-4 combo?
VC: "We used it right up until 2002 or 2003. At one point, I'd bought about 15 Micros, still in their boxes, so I always had another one if something went wrong. The actual technical process of 'making' a song didn't change for donkey's years. I've tried MIDI, but I still don't think it's as tight as CV/Gate. Even though I use Logic, all the synths are controlled via CV/Gate."

Having worked with hardware, outboard, a sequencer and cables for so long, was your move to Logic a difficult one?
VC: "It happened when I moved to the US and found myself with nothing more than a guitar, a laptop and Logic. We were getting ready to start work on a new album, so I had to learn Logic and I had to start writing songs. I'm crap at just trying to sit down and learn something, but if there's something I need to do, I'm very good at getting stuck in.

"The main problem was programming with a mouse, but once I'd mastered that, things settled down. I still wrote my songs on the guitar, but instead of transferring them to a hardware sequencer, I transferred them to Logic."

"I'll never stop using analogue synths, no matter how good the software gets. They're tactile... they don't always do what you want"

Did it change how your songs sounded?
VC: "Ha ha! The softsynths didn't sound as good. I know this is very personal for each musician, but we did do one album entirely with softsynths and it felt different to me. The quality of the sounds was... just not as good.

"I have done the comparison test with some basic models like the Moog, and there's no doubt that the sounds on them are getting better all the time. I guess it's a bit like when Yamaha first introduced a digital synth, the DX7. At first, digital synths sounded quite crude, but technology pushed the sounds further and further.

"I'll never stop using analogue synths, though, no matter how good the software gets. They're tactile... they don't always do what you want. I like that."

Any soft synths used on the later albums?
VC: "A few. Alchemy – which comes with Logic – provided the odd sound here and there. I think my intention was to replace them when we started putting the album together, but I never got around to it.

"In terms of effects, that's much more weighted towards software. Most of the Logic native stuff is excellent, plus I've got Waves and some of the Oxford plugins. I was never a collector of analogue [effects] hardware like I was with the synths. That got a bit obsessive for a while. I had people all over the world looking for stuff. I think I'm cured... well, I would still like a Wasp, but that's it."

So, analogue synths make all the actual noises and you put those noises together with software?
VC: "Exactly. The two worlds working together. I have all the synths running live until I've got a fairly finished version of the song, then I send that to the computer, one synth at a time. As I've got deeper into Logic, I've also started to mess around with audio inside the computer. That's the side of this technology that really excites me. I can take the main ingredients of a song and put them together in a way that would be impossible in the analogue word... well, it would be possible, but it'd take you a hell of a long time to do it."

As an electronic pioneer, do you still keep tabs on what's happening out there?
VC: "Yes and no. I've been listening to a lot of techno; I like that dark groove. I flick through a lot of stuff on Beatport and find myself constantly amazed by the way people are manipulating sound. But what I always find is that, no matter what genre it is or how many fancy techniques you're applying in the studio, you still need a song. It's the strength of the song that makes all the difference."

Erasure's *The Neon*, is out now and check out Vince's record label at veryrecords.com.

Photographed by Doron Gild

Vince and Andy are playing back-to-back dates on their UK tour in 2021

HEAR MORE

A Little Respect
bit.ly/EraALR

Love You to the Sky
bit.ly/EraLYTTS

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Tainted Love
Soft Cell
Year: **1985**
Original Synth:
Synclavier/Synare
Plugins used: **DuneCM/Phonec CM**

> Originally recorded by Gloria Jones in 1964, *Tainted Love* flopped upon its release as a B-side to her single *My Bad Boy's Comin' Home*. The song didn't hit the charts, and was forgotten until it started getting played at Northern Soul dances about ten years later.

Marc Almond heard the song at a club he worked at, and subsequently Soft Cell began to play it in their sets before doing a recording of it in 1981. The song shot to number one in the UK, riding the wave of popularity synth pop was enjoying.

As with many other tracks in this era, the real instruments of Jones' version were replaced with synths and a drum machine rhythm track, with the iconic intro bleep made by running a snare from a Synare drum machine through a Delta Labs DL4 delay unit, and the main lead coming from a Synclavier. Now, let's make our own take on the sounds using a double header of synths from the plugins you can use at filesilo.co.uk.

> Step by step Intro bleep/main lead

1 > Make the bleep first, using DuneCM. Open the synth, and set Osc 1 to a square wave. Tune it down by one octave, then reduce the amp Attack, Sustain and Release to 0%. Pushing Decay to 55% opens the sound. Load HY-FX CM onto the channel, with the simple delay effect selected.

2 > Set the Delay Time to 1/64 notes, with the Feedback at 2 o'clock. The bleep takes on a ringy tone, similar to the original sound. Next, back off the mix to around 10% for a more subtle effect. Let's use Phonec CM to create the lead; start by loading the Init preset to reset the synth.

3 > We'll set Oscs 1 and 2 to organ; this is a waveform that mimics an electric organ. Pitch Osc 2 down by five semitones, then increase Osc 2 level to around 20 to mix a little in, thickening the sound. Increase the noise amount to around 5, layering a subtle amount of noise with our lead.

4 > Remove some unwanted bass from our sound by pushing the High-Pass Filter to 60. Add a retro feel by setting the Melt control to tape, then pushing it up to 30, adding wow and flutter. Reduce Volume to around 70, so that the finished sound sits more comfortably in the mix.

Just Can't Get Enough
Depeche Mode
Year: **1981**
Original Synth:
Roland Jupiter 4
Plugin used:
ThornCM

> One of the catchiest 80s synth pop tunes of the time, *Just Can't Get Enough* was Depeche Mode's third single, first released on Mute Records as a single in 1981, then appearing on their album *Speak & Spell*.

With the instrumental composed entirely of synthesised instruments over a drum machine beat, the song reached No 8 in the UK singles chart, and was a big part of the technology-driven approach to music making that was prevalent at the time.

The sound from the track that is an instantly recognisable earworm is the main riff, which was originally played using the classic Roland Jupiter 4 analogue poly synth. For our version of the sound, we'll use Dmitry Sches' excellent ThornCM to recreate the classic Depeche Mode tone in our DAW.

> Step by step Main riff

1 > Set Osc 1 in ThornCM to a sawtooth wave. Turn on Osc 2 and set that to a triangle, with the tuning pitched up seven semitones. This adds extra thickness and depth. Next, move Osc 1's Position dial to 10%, for much-needed high frequency harmonics on the sawtooth wave.

2 > Shape the sound more using the amp envelope. Pull the Attack and Sustain down to 0, with the Decay set to around 50% and Release at 35%. This'll make the notes played sound tightly controlled, without being too staccato. Set the filter Type to Fat LP12, similar to that of the Jupiter 4.

3 > Reduce the Filter Cutoff to 13kHz, then increase Res to 30%. This rolls off high frequencies while focusing the high mids, but reduces loudness compared to the unfiltered sound. Pushing filter Drive up to 10dB makes up the gain difference, whilst adding crunch and vibe.

Don't Go
Yazoo
Year: **1982**
Original Synth: **ARP 2600**
Plugin used: **AlphaCM**

> Vince Clarke knows a thing or two about crafting an electronic pop song, a fact made clear by the number of cracking tunes he composed for Depeche Mode's 1981 debut LP, *Speak & Spell*. After the success of that LP, he quit the band. After all, who wants worldwide success? Fearing their label (Mute) would drop him, he penned *Only You* in order to keep them interested. He brought in an old acquaintance, Alison Moyet, to sing. Mute hit 'em up for a single, the b-side of which was to be *Don't Go*. Clarke knew it was too strong a song to relegate to the flip side, and *Situation* was hurriedly slotted in. *Don't Go* would be the second (smash) single from the pair's debut LP, *Upstairs at Eric's*. An ear-worm of an intro from an ARP 2600 sets the stage, carried along by an incessant bass courtesy of Clarke's ever-present Sequential Circuits Pro-One. A thick Roland Juno-60 bass complements Moyet's soulful voice. Despite the low track count, the entire concoction is big, bold, and unforgettable.

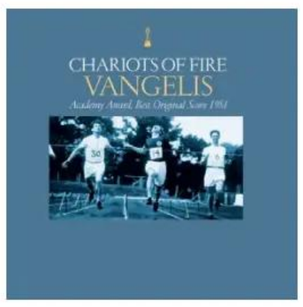
> Step by step *Don't Go* lead

1 > Set AlphaCM's Z-Init patch. Select Square1 for both Oscs' A wave, and a sawtooth for Osc 2's B Wave. Set Osc 1's Wave fully clockwise and Osc 2's to 10 o'clock. Set the Octaves of both Osc's A waves to -1. Crank Detune up to just past 10 o'clock. Set the Filter's Drive to just under 2 oc.

2 > In the Matrix, select LFO 1 as source for two slots. Set Osc 1 Symmetry as the first destination, and Osc 2 Symmetry as the second and Amounts to 0.9 and 0.66. Un-sync the LFO, and set its Freq to 3.8. In the Filter, the Cutoff is just over 9 o'clock, and Resonance just under 9.

3 > Filter envelope Depth should be full. Give the Attack knob a nudge. Set Decay to 10 o'clock, and Sustain off. Release should be set to just under 11 o'clock. A quick play tells us we're almost there! We'll leave it to you to figure out the riff – we don't want to infringe on any copyrights!

4 > On the amp, nudge the Volume up to 12 o'clock and kill the Velocity. Give the Amp Env's Attack a nudge and crank both the Decay and Sustain clockwise. Release should be 10 o'clock. Use Acon Digital CM Verb and dial in a short reverb to mimic the 2600's springs.



Titles, aka *Chariots of Fire*
Vangelis
Year: **1981**
Original Synth: **Yamaha CS80**
Plugin used: **AlphaCM CM**

> It seemed an improbable pairing: Hugh Hudson's historical film set in 1924 scored by a synthesist? Absurd, yet this collaboration earned three BAFTAs and four Academy Awards. Greek musician Vangelis' particular penchant for evocative and emotional performance would provide the synth-heavy soundtrack with a romantic flair. More so, it would introduce a new form of electronic filmic music, still popular today. The *Titles* theme for *Chariots of Fire* combines acoustic piano with Vangelis' beloved Yamaha CS-80 to create a dramatic, optimistic anthem. A steady electronic pulse, echoing percussion, resonant fanfares and that simple, unforgettable piano are arranged perfectly. Released as a chart-topping single, it became an obligatory feature of athletic events for decades to come.

> Step by step Filmic brass

1 > Set AlphaCM's Z_Init patch, and sawtooth waves for Osc 1, slots A and B, and Osc 2, slot A. We'll select a Square1 for Osc 2's B slot. Osc 1's B slot should be Transposed to +1, and Osc 2's A should be -1. Osc 1's Wave knob is just over 10 o'clock. Detune is just under 10 o'clock.

2 > Filter Cutoff is down, Res just over 9 o'clock, Filter Env Depth nearly full, Attack 10 o'clock, Decay just over 10 oc, Sustain 2 oc, Release nearly halfway up. Amp Attack is 11 o'clock, Decay at 1, Sustain at 3 oc, and Release at noon. LFO Attack is 10 oc and its Frequency at 4.94.

3 > In Matrix, Velocity modulates Filter Cutoff by 0.21. LFO 1 and Filter Env modulate Main Pitch by 0:08 and 0:19, respectively. Set the Chorus' Wet knob to 10 o'clock. Finally, drop an instance of Acon Digital CM Verb over the top, and choose the Large Gothic Cathedral setting.

SYNTH POP

From percolating percussion to syncopated sequences, we'll show you everything you need to create an instant synth pop classic – without spending a penny!

> It's hard to say where synth pop began – maybe with Roxy Music and the artful wobble of Eno's VCS 3. Kraftwerk had an undeniable influence, as did Bowie's *Low* LP.

One could argue that it rose from the ashes of punk, with its emphasis on simplistic song structures and DIY ethos. Would-be post-punk popsters like Daniel Miller and John Foxx switched on to the possibilities offered by cheap, monophonic synths, tapping into their limitations to create smart, sparse arrangements – a minimalism that became a synth pop hallmark. Artists like Fad Gadget and The Human League found acceptance with the post-punk crowd, thanks to their unusual, often extreme shows, while Ultravox and Gary Numan evoked a cold intellectualism, a world away from the sex-and-drug excesses of stadium rockers.

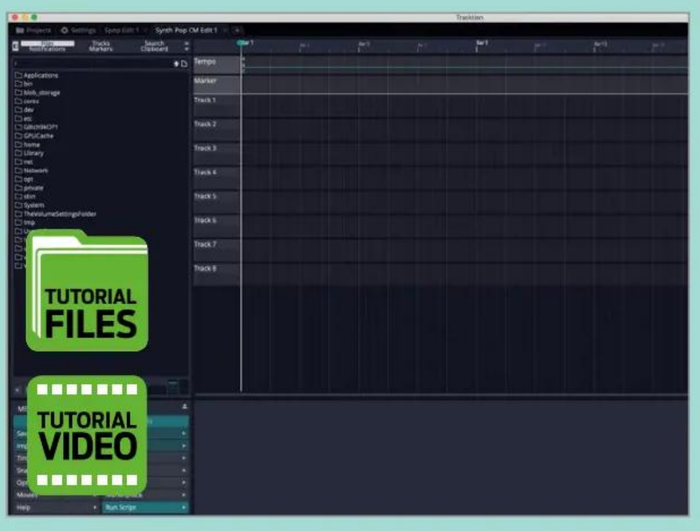
Yet as the new wave gave way to new romanticism, synth pop followed suit. The once-experimental Human League fractured, reforming as a sleek pop outfit, while former Depeche Mode synth wizard Vince Clarke re-emerged with Yazoo and Erasure, each slicker and more accessible than what came before.

Today, of course, synths are very much the stuff of pop and a fascination for all things 80s has reignited interest in synth pop.

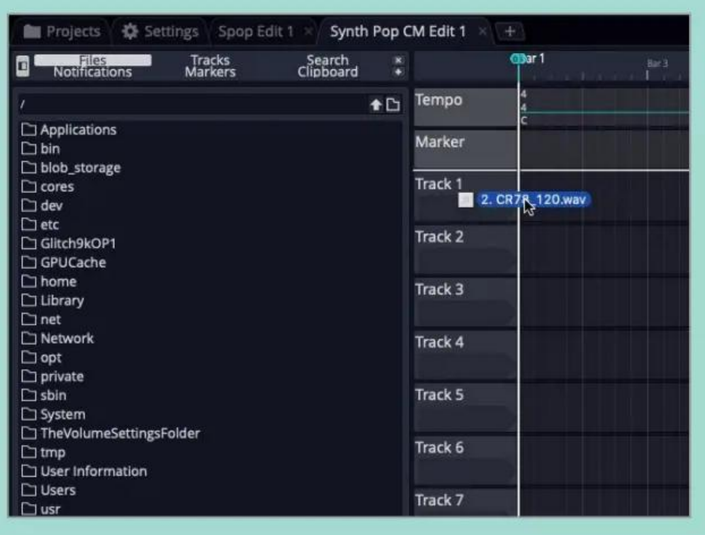
It's now easier than ever to make synth pop, and we'll take you through the process using nothing but your DAW and the instruments and effects available filesilo.co.uk (Bookazines/ Music Producer's Guide To Electronic).

>Step by step

1. The rhythm section



1 > We're providing the plugins and audio files, but you'll undoubtedly prefer to work in the DAW of your choice. Don't have one? Get a free DAW, like Tracktion's T7 DAW, a complete, unrestricted music production environment from Tracktion.com. We dig T7 DAW quite a lot, so we'll use it, but follow along in whatever DAW you like.



2 > Many a synth pop classic got its start with the gentle pitter-patter of the legendary Roland CR-78 drum machine. Its percolating patterns propelled hits by Ultravox, Gary Numan and Orchestral Manoeuvres in the Dark. We've recorded a snippet of one for you. Called CR78_120.wav, it can be imported into your project or dragged onto an empty track.

3 > As seen by the file's name, our drum loop's tempo is set to the universal default of 120bpm, and our project's tempo is set to the same. We want to loop the sample across a number of bars. In T7, this is accomplished by clicking the little "L" button in the clip's header, after which simply drag it by the arrows at either end of the header to the desired length.

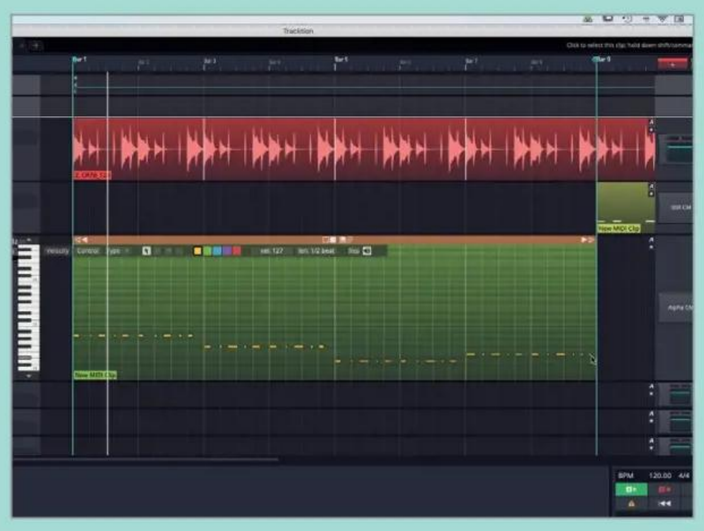
4 > On many a classic synth pop track, the CR-78 was layered with real or sample drums. We'll do the same, using the StiX CM plugin from XILS Lab. We'll instantiate it on Track 2. In T7 DAW, this is done by dragging the grey '+' widget down to the desired position on the right-most side of the track itself, then selecting the plugin from available menus and options.

5 > Select your connected MIDI controller as the Track's input to trigger your plugin. Open the plug's editor. Rather than using a prefab kit, click the BD tab in the upper left, go to the Drum Preset menu and find the preset called BD Sample Massive LtZ. Click the Snare tab, then load the preset SN wadm_909_snare_021. Give the snare's Level knob a boost.

6 > Next, go to bar 9 and create a two-bar MIDI clip on Track 2. Now, draw in some notes for the kick and snare. Just mimic the positions of the CR-78's kick drum in this clip, and stick the snare hits on the backbeats. Next, loop your clip and stretch it out for a total of eight bars. It might help to loop playback of the section you're working on.

>Step by step 1. The rhythm section *(continued)*

7 > The drums are loud! The overall level can come down. We'll name our tracks, too. We're not trying to get a proper mix yet, just tame the volume. Now add a bass track. Instantiate LinPlug's Alpha CM, which has been modelled after Roland's Juno synths. Open its editor and choose the preset called BAS-Dark-TEG.

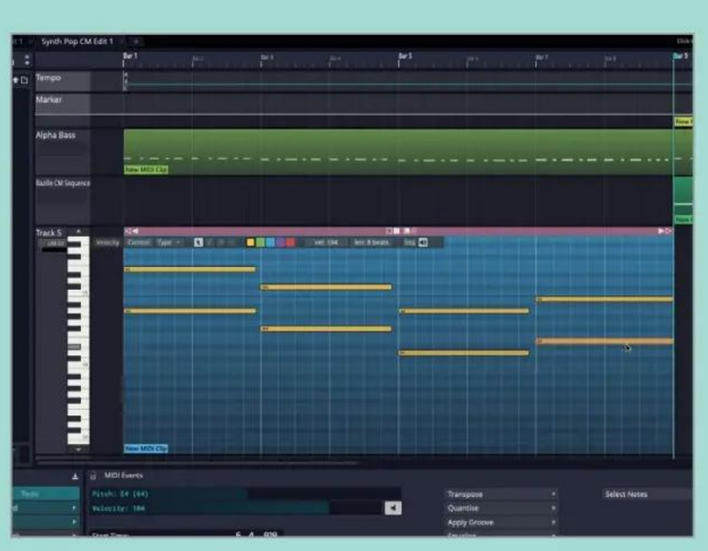


8 > Create a new MIDI clip on Track 3, starting at bar 1, beat 1. This clip should be eight bars long. Either record a live bass part, or draw notes in. These notes serve as the root notes of a progression, with each chord holding for two bars. We've chosen the key of A, so we'll do two bars each of A, F#, D, and E notes.

9 > Loop your new clip and extend it to the end of bar 16. Create an instance of u-he's BazilleCM on Track 4 and find the Antivirus preset. This is a rhythmic sequence patch. Create a nine-bar MIDI clip at bar 9. Play/hold the root notes used for the bass at a higher octave. The pattern syncs with your project's tempo.

>Step by step 2. Strings 'n' things

1 > The first wave of synth pop classics were drenched in paraphonic string machines. These single-purpose synths first hit in the 70s, offering a means to play chords. Some models were used well into the 80s. Get a similar sound using XILS Lab PolyKB II CM. Instantiate it on Track 5. Create another nine-bar MIDI clip at bar 1.



2 > Go to the menu in the top-left (where it says 'Init') and open it. Go to Strings and select the patch called STR Sustenuto Pad CD. Again, hold your chords over two bars each. Many popular synth pop artists were untrained, so keep things simple, obvious even. We've used predictable dyads, as the patch is pretty thick.

3 > The low end needs reinforcement. Instantiate ZebraCM, and create a new eight-bar MIDI clip at bar 9. The default patch is fine. Use just the root notes in the lower octaves. In the second half of the clip, raise 'em an octave for a nice effect. Tweak ZebraCM's envelope settings and dial down the filter's Env Modulation a bit.

FOUR SYNTH POP CLASSICS

SPARKS
WHEN I'M WITH YOU
This 1980 single has all the ingredients for a synth pop classic – catchy hook, quirky lyrics, and – unusually for Sparks – a wistful synth solo.

bit.ly/spks_wiwy

ERASURE
SOMETIMES
Erasure's fourth single was their first big hit, marking keyboardist Vince Clarke's third successful synth pop outfit after Depeche Mode and Yazoo.

bit.ly/ersr_smtms

SILICON TEENS
MEMPHIS TENNESSEE
After the success of The Normal's *T.V.O.D.* b/w *Warm Leatherette*), Daniel Miller conceived this fictional synth pop group with Fad Gadget's Frank Tovey.

bit.ly/silitns_mt

LCD SOUNDSYSTEM
I CAN CHANGE
Decades after the first wave of the new wave, James Murphy's eclectic LCD Soundsystem produced one of the finest examples of synth pop ever recorded.

bit.ly/lcd_icc

PRO TIPS

NO FRETS, NO FROWNS
Synths were – are – obvious solutions for creating throbbing pop bass riffs. However, electric bass guitars are also a staple, and their lively sound suits a synth arrangement. Fretless basses were especially popular among new wave and synth pop. You can hear them on tracks by Gary Numan and Japan, both of whom called upon the talents of the late, great Mick Karn.

STRING MACHINERY
Remembering that synth pop stems from the larger new wave scene, which itself emerged from punk – it's not all that surprising that edgy guitar riffs often found their way onto synth pop productions. Often slathered in echo and chorus effects, guitars were often an important – if slightly anachronistic – element. Some of the most imaginative examples can be found in songs by A Flock of Seagulls and Ultravox. Bill Nelson and Gary Numan were also both guitarists before expanding into synths.

The role of effects in the mix

Today's desktop producer has a virtually unlimited supply of instruments and effects on hand, and yet many of the best-known synth pop hits were created with one or two synths and only a handful of the most rudimentary of effects.

It'd be worth mentioning that home studios were something of a rarity in synth pop's heyday, so pro studios were usually where all the action took place. That doesn't go to say that these were glossy, high-end productions. Quite the contrary in fact, as many synth pop bands were lacking the financial resources for extended session hours, and the time to experiment.

Therefore, it's wise to keep the mix simple. A typical studio of the day might have one or two good reverb units, one of which might be singled out for a gated snare sound, while the other might have been shockingly over-applied to guitars, background singers – even the lead vocal.

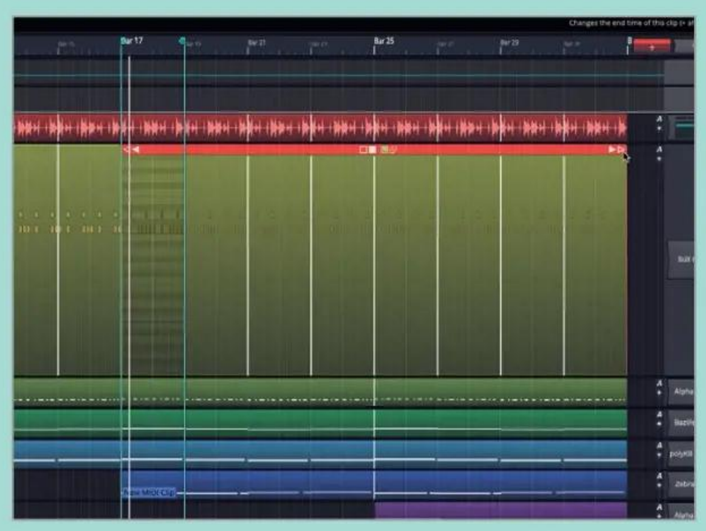
Of course, that isn't to say that you can't modernise your take on synth pop with tools that weren't available to new wave artists of the 1980s. The only rule is that there are no rules!

> Step by step

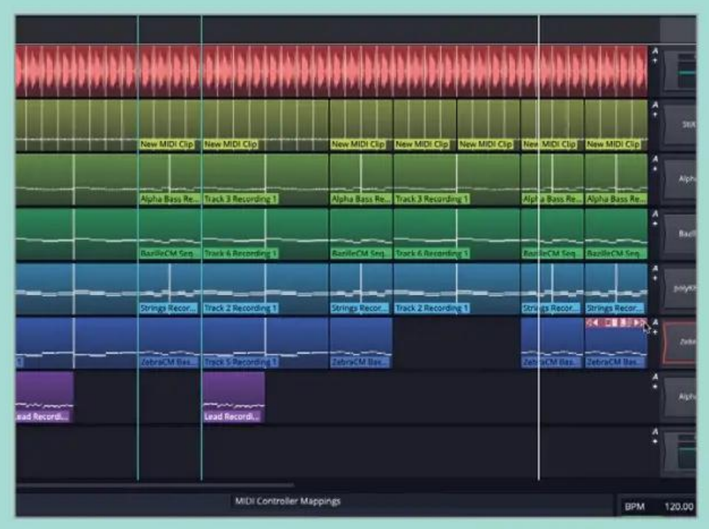
3. Fleshing out the arrangement

1 > The track could do with a lead. Open another Alpha CM and call up the preset patch named LED-SquareDeal-TEG. The new part will once again span eight bars. If you are able, this would be a good candidate for a live take. You can always use your DAW's quantise function to polish the rough bits.

2 > Let's take a step back and look at what we have. There are now seven tracks, representing all of the basic instrumental requirements. We've only got 17 bars, with the first eight only containing the CR-78, strings, and one of the bass tracks. This isn't actually a bad way to start the song.



3 > Everything else jumps in rather abruptly at bar 9. A more gradual build-up would be preferable. Move the ZebraCM Bass to bar 17. The Alpha CM Lead track will start at bar 25. Create a second Drum clip at bar 17, adding more kicks. Next, extend this and the remaining tracks to bar 32.



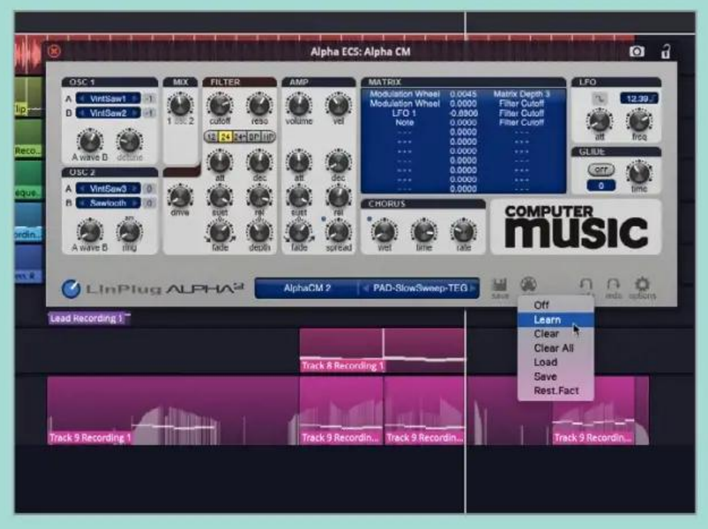
4 > You can create new eight-bar parts for each track (barring the CR-78), and these can serve as a chorus section. The parts can be arranged into a typical song structure, as we've done here. In our example, we've simplified the kick track starting at bar 73, and dropped the ZebraCM bass and lead for a bit.

> Step by step

4. Fills and flourishes

1 > At this point, the song is pretty well defined with an intro, verses, choruses, and a middle section where it changes up a bit. This would be a good time to consider adding some drum fills at transitional points in the song.

2 > That middle section starting at bar 73 needs something, so add an instance of Dune CM onto a track and dial up the pad sound called Vox Morph IW. It'll just double the string chords here. This sound is reminiscent of sample-based workstations of the early-1980s, such as the Fairlight CMI or Synclavier.



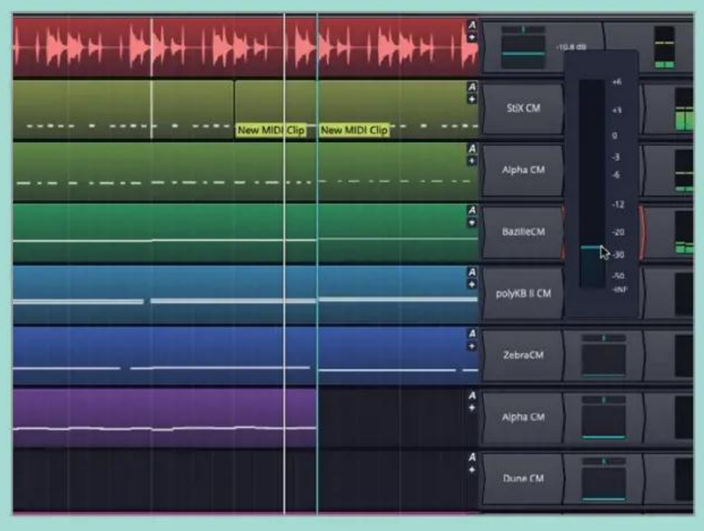
3 > Finally, add another Alpha CM track, using the PAD-SlowSweep-TEG patch. Play in the root notes in some of the verses and choruses, and middle bit. If you've a MIDI controller with knobs, you might consider using Alpha CM's MIDI Learn (ECS) to assign knobs to various functions and tweak them in real time.

> Step by step

5. Mixing

1 > Now that our arrangement is complete, it's time to sink into the mix. Your DAW might offer a standard hardware-style vertical mixer, but mixing in T7 DAW is handled in the main view. To begin mixing, it might be best to reduce the levels of all of the tracks to nil.

2 > Every engineer works differently – some like to start with the beat, while others may bring the vocals in and mix to those. We haven't any vocals in our track (though there is room for them, if you want to add them). Let's mix our CR-78 track in first, leaving plenty of headroom.



3 > It is often beneficial to loop playback of the busiest sections like the verse or chorus, mixing those first. After setting the level for the CR-78, the Drums track can be brought in, with the BazilleCM sequence and Alpha CM Bass coming next, carefully balancing the mix between the two against the rhythm tracks.

4 > Panning the BazilleCM and Alpha CM bass tracks opposite one another (just a bit) might open up the mix a bit. The ZebraCM Bass and polyKB II CM Strings tracks can be added in next. The latter could use a bit of motion, so insert the HY-FX-CM, calling up and tweaking the Phaser preset.

5 > The ZebraCM Bass track is a little bit on the boomy side of things. This would be a good candidate for Overtone's PTH2A-CM equaliser. This is a vintage-style program EQ styled after the famous Pultec units. It can be used to attenuate the low end at 60 Hz, with the KCS set to a12 for a broad stroke.

6 > The Alpha CM lead can be sent to PSP's cmDelay, instantiated on an aux send. We're sending our Alpha ECS track to it as well. Another aux might be created for Acon Digital's CM Verb for, say, the drums. For a finishing touch, you could use the SunRuysCM compressor plugin on the master.

Sample platter

Though the term synth pop suggests the genre is produced entirely from synths, the artists that created it embraced any new tech they could get. As such, drum machines and samplers were also commonly used to create synth pop tracks, though their initial cost put them out of reach of all but the moneyed few.

Those that did have access to such lofty instruments often found that the cutting edge wasn't exactly razor sharp. Early samplers and sample-based drum machines were limited by the tech of the day, meaning 8-bit sample depths and sample rates that would scarcely be acceptable to today's producers.

Remember this when trying to re-capture the sound of classic synth pop. The lo-fi vibe of that old digital gear can be simulated with the use of bit-reduction plugins or through the use of low-resolution samples. There are also virtual samplers such as TAL-Sampler and 112dB's Morgana that emulate the circuitry of the old dears.

Emulations return you to simpler (better?) sample times

POWER TIP

> Back to the source

Not every synth pop production is built from the ground-up using virtual synthesisers, but ours is. This provides us with an interesting option when it's time to mix – that of tweaking our sounds to fit in the mix, rather than trying to forcibly hammer each track into place with equalisation and compression. Keep in mind that EQ and compression are generally used to compensate for shortcomings in the recorded track. Rather than resort to such remedies, we can use our synth's tuning and filters in order to tweak frequencies, and help reduce velocity sensitivity to tame dynamics.

GARY NUMAN

There aren't many people who can claim to be true pioneers of Electronic Music. This, however, is certainly one of them...

> It's fair to say that Gary Numan doesn't write many 'upbeat' tunes. The electronic legend's breakthrough album, 1979's *Replicas*, depicted a cold, dark world of isolation and unhappy androids. Follow-up albums featured paranoia, atheism and yet more isolation.

While recording 2013's comeback album *Splinter (Songs from a Broken Mind)* – we say 'comeback' as it was Numan's first to chart highly for many years and widely regarded as his best outing in decades – Numan was plagued by depression and wrote about the effect it was having on his family.

"Thankfully, I beat the depression," says the smiling 63-year-old. "And I have to say that life is great. I'm enjoying living in LA [*he moved there in 2012*]. I've got a wonderful family. *Splinter* had some great reviews and then I signed a record deal with BMG."

Numan followed up that album with *Savage (Songs from a Broken World)*, very much a continuation of *Splinter*'s sound and success. Track titles included *Pray For The Pain You Serve* and *My Name Is Ruin*.

"People write about what affects them, and that album was about global warming. Initially, some of the ideas came from a novel I was writing about a post-global warming world. That's why I decided to film the video for *My Name Is Ruin* in the Californian desert. I was trying to say, 'Look, this is what we'll be left with. A wasteland... and temperatures of 46 degrees'."

Numan's latest album, *Intruder*, is very much the third album in the trilogy, designed as it is as a

companion piece to both *Splinter* and *Savage*.

"I don't normally get up on my soapbox about stuff, but if the politicians don't wake up, this really will be a broken world."

Intruder, then, continues the theme and while it might be bleak, it is the easiest songwriting seam for Numan to mine.

He agrees: "Ha ha! Yes, even though life is being kind to me at the moment, I still struggle to write happy songs."

Gary Numan's unhappiness has served him well, fuelling his musical imagination for over 40 years. Encouraged by the anger and energy of punk, the teenage Numan picked up a guitar and formed a band, but very quickly discovered something far more interesting than a Gibson Les Paul: a Minimoog.

Barely a year later, he'd introduced electronic music to the masses with tracks like *Are 'Friends' Electric?*, *Cars*, and a trio of Number One albums. The music press hated him and his bloody synthesisers, but Numan has been namechecked by everyone from Liam Howlett and Trent Reznor to Beck and Damon Albarn.

Before you got your hands on that Minimoog, did you have any interest in electronic music? Had you been listening to Bowie, Roxy Music, Kraftwerk and the like?

Gary Numan: "I did have a couple of Kraftwerk albums, but it all sounded a bit too mechanical for me. Bowie's *Low* album was the first time that I'd really been struck by the power of electronic music... tracks like *Warszawa*. There's a grand, almost classical melancholia to those songs. That atmosphere hinted at something I was searching for, and I found it far more interesting than any of the punk stuff that was happening in the late 70s.

"I didn't know it at the time, but I suppose I was trying to combine that electronic thing with the spikiness of punk. And, as luck would have it, there was a Minimoog in the studio where I was working on an album of punky, guitar-based songs. I plugged it in and played a note. My God, what a wonderful sound!

"We're now in an era where everyone is familiar with the synthesiser, but back in 1977 and 78, they were still something of a rarity; almost like a novelty instrument that people used for making funny noises. To actually have one in my hands and to be able to feel the power of that sound was... well, it changed my life.

"My first thought was, 'What if I transfer my basic guitar riffs to the Minimoog?' Instead of going, 'chug-chug' with barre chords, I played 'dum-dum' on the Moog. It sounded fucking brilliant! Completely by accident, I found what I was looking for."

The main riff for *Are 'Friends' Electric?* or *Cars* could have been played on a guitar, but it just wouldn't have sounded the same.

GN: "Exactly! There was this sense of menace and drama that seemed to be built into a synth... a simple riff became much more than just a collection of notes. And that was perfect for me, because I wasn't a particularly good musician.

"Even though punk was happening, there was still this idea that 'songwriting' was something special. You had loads of musicians who were writing stuff with all these tricky chords and million-note solos, but with a synth, you didn't need to do any of that. I remember being interviewed in those early days and saying something like, 'Why play a million notes when one note will do?' With the Moog, you could literally take a single note and it could be an ever-changing, unfolding masterpiece.

"We're now in an era where everyone is familiar with the sythesiser, but back in 1977 and 78, they were still a rarity"

"Is there another instrument that will do that? Of course, if you put a guitar in the hands of a master musician, he can do that, but the beauty of a synth is that anybody can play it and anyone can make an interesting sound with it. The knobs and sliders are right there in front of you... it's almost daring you to have a go."

Despite the success and the revolutionary sound, the press really didn't take kindly to you, did they?

GN: "I was young, and I'll admit that I did have a big mouth, but I don't think I did or said anything that deserved that level of... they just seemed to enjoy having a pop at me. They had a go at me for looking miserable on *Top of the Pops*. I was nervous! I wore makeup cos I had acne!

"And they were always having a go at the music. When things were going well, that didn't bother me so much, but most artists have a cycle of popularity and when my sales began to decline, they really started taking the piss. Is it a crime to try different directions and different musical themes?

"That constant criticism really knocked me back. Obviously, it didn't help that, once we hit the 90s, my career was going down the toilet. It was a horrible time; a downward spiral.

Musically, I was in a hole. There was a period of about two years where I never kept anything that I worked on. My confidence was so broken that I almost thought it was going to finish me off. I wondered if I was ever going to be able to write anything that people would want to hear. As far as I was concerned, the career was over.

"Luckily, that coincided with a period of... let's call in reappraisal. Suddenly, you had people like Trent Reznor saying nice things, people started being a bit kinder, and I felt I could stick my head above the parapet.

"The strange thing is that I've never really fully recovered from that two-year depression and panic. As soon as one album's finished, I start panicking about the next one. I start worrying if my career's going to be OK. Will I ever write another decent song?"

Even after all of these albums?

GN: "The thing about being a songwriter is that it's one of those disposable talents. It's a fairly common ability. Look around you and look on the internet; songwriters are ten a penny. And a lot of them are great, great songwriters who will never get a chance to bring their music to a wider public. The only thing that distinguishes me from them is luck. Luck that I found that Moog. Thank god it wasn't a clarinet that somebody had left in the studio!"

If only out of a sense of loyalty, is there still a Moog in the studio?

GN: "There is! In fact, there are two. Moog very

Gary Numan in his studio, based at his LA home where he has been living happily since 2012

One electronic music icon gets hands-on with another electronic music icon

kindly sent me a Voyager and Minimoog D, which did get used on the last album. I have got the software versions, but, c'mon, if the real is thing available, you're going to use it.

"That's pretty much it when it comes to hardware. Everything else is in the box. Why would you lug around all that hardware when you've got an almost limitless collection of fantastic-sounding synths that you can load on to a computer?

"That move from traditional studio to on-board was a complete godsend for me. There was no way that I could have survived making albums in a 'studio', because it simply became too expensive. With Pro Tools and a computer, I can make an album anywhere.

"Not only that, but I've also learned a whole host of production and mixing skills that I would never have learned in the old days, because there was always somebody there to do it for you. And usually somebody who was being paid out of the money you hadn't yet earned from selling the album that you were working on!"

Tell us about the studio setup in LA?
GN: "I live in an area that's residential use only, which means I can't build a full recording studio. The compromise is a large vocal booth in an outhouse. It came as a flat-pack, with a couple of blokes who set it up in an afternoon. That's my working space. All the pre-production, vocal recording and demo-ing is done there, but then it gets sent to [*long-term collaborator*] Ade Fenton. That's when we start putting together the finished version."

Are there certain software plugins that you know will give you a 'Numan' sound?
GN: "If I could, I would create a whole new palette of sounds every time I made an album, but, in reality, there are a few 'stock' plugins that keep finding their way onto albums."

You've been very vocal about one of those: your love of Spectrasonics Omnisphere.
GN: "The king of all plugins, without a doubt. 1 was pretty bloody amazing, but v2 takes it into another world. What a phenomenal array of sounds, and what a phenomenal array of starting points – pull up any preset and you'll be inspired. But then you've got the manipulation, too: easily accessible, incredibly intuitive ways to change and shape the sound. If you don't find what you're after in the presets, you will be able to create it fairly quickly.

"Anybody who knows my music will know that I use a lot of pads and atmospheres. But the problem with pads and atmospheres is that they

Kit list

HARDWARE
Apple Mac Pro
PMC TwoTwo 8
ATC ASL50
Elektron Analog Keys
Access Virus TI
Waldorf Blofeld
Thermionic Culture Culture Vulture
Eventide Eclipse
Sontronics Saturn

SOFTWARE
Apple Logic Pro X
Spectrasonics Omnisphere
Native Instruments Reaktor, Absynth, Kontakt, Maschine, Battery, Massive, Guitar Rig
FXpansion BFD
XLN Audio Addictive Drums
Softube Tube-Tech
iZotope plugins
FabFilter plugins

Gary Numan on the digital revolution

"There's a lot of doom and gloom about the music industry these days, but, to me, it feels more exciting than it has done in years. Yes, some of the labels and the chain record stores have fallen by the wayside, but do we really miss the way that the music business used to work? Record label signs a band, puts out a single, single doesn't do well, label drops band. 'Thank you, good night.'

"There have been good and bad things said about the impact the internet has had on music, but all I can say is that it's allowed me to carry on making music. Yes, the internet and social media have created a certain state of flux, but that will settle down. Or maybe it won't. Maybe flux will be the new normal. Constant reinvention; constant change. But what's wrong with that? How ridiculous would it be to still be making music with the same setup I had 30 years ago? You can't keep looking to the past – music has to keep moving forward."

can all start to sound a bit samey. With Omnisphere, you don't seem to get that. Each sound you choose and add will always give you that something a bit different.

"I use it a lot on everything I do, but I know that I'm only scratching the surface of what it's capable of. A truly beautiful piece of software."

So, you like it, then?!

GN: "Ha ha! I like anything that Spectrasonics do. Native Instruments, too. I've got a suite of their stuff on the computer. Some Korg plugins; Ethno 2, when I need to get ethnic.

"I'm still a fan of old-fashioned found sounds, too. I have a stereo recorder that I carry around with me when I'm ready to start making an album, recording bits and pieces from a normal day: traffic, people, the sound of the desert. They can really help to create atmosphere because... well, they are, technically, 'atmospheres'."

You were awarded the Ivor Novello Inspiration Award in recognition of your influence as an electronic pioneer. In the almost-40 years you've been releasing music, has the actual process of songwriting changed much?

GN: "Obviously, there's a lot more to play with in the studio, but my starting point has always been the piano. When I was kid, my parents knew I liked keyboards, so they bought me this knackered old upright piano. That's what I started writing songs on, and that's what all the early albums were written on. I later realised that it was slightly out of tune, which probably helped me create something a bit... different.

"These days, it's a piano preset from the computer, but that's where I work out melodies and chord structure. After that, it goes into the computer and gets fleshed out with a few pads and loops, I add my gobbledegook vocals, write lyrics to the gobbledegook, and there's a demo. If things are going well, the demo version takes about a week, but you can usually tell on day one whether the idea is going anywhere.

"Of course, that's the point where my mind starts racing and I think, 'That's it. I've lost it!' I literally have to start talking myself out of the panic. 'C'mon, Gary. Things will be OK. This is just an off day. Pull yourself together'. If anybody ever recorded it, they'd think I'd gone mad!"

> "Of course, that's the point where my mind starts racing and I think, 'That's it. I've lost it!'"

Gary Numan's album *Intruder* is out in May 2021

HEAR MORE

My Name Is Ruin (2017)
bit.ly/GNmnir17

Are 'Friends' Electric? (Live)
bit.ly/GNafeLive

garynuman.com
soundcloud.com/garynumanofficial
twitter.com/numanofficial
en-gb.facebook.com/GaryNumanOfficial

Fade to Grey

Visage

Year: **1980**

Original Synth: **Moog Polymoog**

Plugin used: **u-he BazilleCM**

> We're recreating famous synth sounds using your free Plugin Suite at filesilo.co.uk, and now we enter the 80s with an absolute belter!

Visage was formed by Midge Ure and Rusty Egan in 1978. The pair recruited vocalist Steve Strange, as well as ex-Magazine members Barry Adamson, John McGeoch, and Dave Formula. Billy Currie (Ultravox, Gary Numan), was brought in as well, who remembered an unfinished tune from Numan bandmate Chris Payne. They'd decided to record their unfinished jam with fellow Numanite Cedric Sharpley as a sort of keepsake after a tour. Chris Payne had jammed out the song's signature riff with a Minimoog supplying the bass sound, and the infamous Polymoog 'Vox Humana' preset for the pad. As luck would have it, the Minimoog failed to turn up for the recording, so Payne recreated the bass pattern using a Polymoog brass patch. Once it was turned over to Visage, Midge Ure composed the lyrics for Strange. The French passages were delivered by Egan's girlfriend, Brigitte Arens.

> Step by step — Repeating synth lead/bass

1 > We don't need a synth as flexible as BazilleCM to recreate Chris Payne's famous buzzsaw sound, but his Polymoog was probably overqualified, too! First switch off the Delay, disconnect the cable from Osc 1 to Out 1, connecting Osc 1 instead to the Filter section's top-left jack.

2 > Connect Osc 2's Output to the jack below the one in which we patched Osc 1. We'll patch the Filter's LP24 jack to an Out 1 jack. Next, find Osc 2's PD Value knob (just above 'Saw') and crank it full. Use Osc 2's Fine Tune knob (under 'Modify') and set it to 7. Set Osc 1's Fine Tuning to -7.

3 > That's already close! However, Mr Payne has stated that he believes the original sound was a brass patch so connect Env 2's Output up to the Filter's lower-left jack. Turn the knob above that jack up to about 104. Bring the Cutoff down to 56. Set Env 2's Attack slider to 15.

4 > Set Env 2's Decay to 25 and its Sustain to 82. Now, set the Release to 20. Go to Env 1, and crank up both Decay and Sustain. The Release should be 13. These shapes give our sound some hint of brassiness. Now it's just a matter of minor tweaks, but be sure to experiment further!

Are 'Friends' Electric?

Gary Numan

Year: **1979 (although also used a lot on his 80s hits!)**

Original Synth: **Moog Minimoog**

Plugin used: **AlphaCM**

> The powerful Minimoog riff from *Are 'Friends' Electric?* is surely one of the most memorable synth sounds – and indeed melodies – of all time. And Numan's first hit was not just important for him; his breakthrough 1979 single not only helped him format his own future 1980s hits, but also set the trajectory of modern music for the years that followed. In point of fact – as he reveals in his interview on page 52 – Numan never intended to get involved with synths, only discovering what they could do for him when a Minimoog was left in a studio where he'd intended to make a punk album. When it came time to record *Are 'Friends' Electric?*, he rented both a Minimoog and a Polymoog. Needless to say, once the single was released, he'd be able to afford his own! We'll show you how to get close with your free plugin below...

> Step by step — *Are 'Friends' Electric?* main riff

1 > Fire up LinPlug's AlphaCM. Go to the patch browser and click the right window to access the presets in the bank. Load the Z_Init patch. Go to Osc 1 and select the Square1 wave. Turn the Wave knob to A. Set its Octave to -1. Do the same for Osc 2, using Square2 as the waveform.

2 > Set Osc 1's Detune knob to just under 10 o'clock, the Filter's Cutoff to just past 12 and Res to just past 9 o'clock. Select the 24+ mode. Set Drive to 2 oc, the Filter Envelope's Decay, Release to just above 10 oc and Depth to 3 o'clock. Set the Amp Decay and Release at 10 o'clock.

3 > Switch Glide to On. Just give the Time knob the slightest nudge. Finally, though the Minimoog didn't have a chorus, we're going to use ours to thicken the sound to make up for the lack of a third osc. Set its Wet knob to 11 o'clock or so, and push the Rate up to nearly 3 o'clock.

Vienna
Ultravox
Year: **1980**
Original Synth: **Minimoog**
Plugin used: **Dune CM**

> Ultravox spent the latter part of the 1970s pumping out expertly-crafted – and commercially unsuccessful – post-punk records, emphasising the coming 'new wave' of electronic pop. Guitarist Robin Simon and singer John Foxx left the band after their third album, the latter replaced by Midge Ure. The new lineup recorded their next LP, *Vienna*, in 1980, although it, too, received a lukewarm reception, only achieving momentum when the title track struck big as a single. As a song, *Vienna* is a slow burn from contemplative croon to (intentionally) bombastic pseudo-pomp. Piano and violin make up much of the instrumentation, but the Roland CR-78 drum machine is a constant, as is the bass from the band's custom Minimoog. String machines are used for syrupy strings, throughout.

> Step by step: Viennese bass

1 > Call upon Dune CM to create a reasonable facsimile of Chris Cross' impactful bass patch. Start with an Init patch and select square waves for all three oscillators. Osc Mix goes to about 29%, and Osc 3 Level to 68%. Set Osc 2's Semi to -12. Osc 1 and 2's Fine goes to -10.0 and 10.0, respectively.

2 > In Osc Common, P/Width goes to 25%. In the Filter, select LP24+Saturation as the mode. Cutoff goes to 27%, and Env to 60%. In the Amp Envelope, set Decay and Release to 50%. (The original Minimoog shared a single control for both Decay and Release.)

3 > Finally, to the Filter Envelope. Here, set Decay at 47% and crank the Sustain down. Our Release should be 38% or so. That brings us very close to the sharp and solid thwack of the original Minimoog sound. You can, of course, fine tune it even further as you like.

Don't You Want Me?
Human League
Year: **1981**
Original Synth: **Roland Jupiter-4**
Plugin used: **BazilleCM**

> The Human League's success was hard won after two cutting-edge LPs and a handful of quirky singles before their breakthrough, 1981's *Dare*. The band had split just as they were set to embark upon a lengthy tour, so singer Phil Oakey promoted Adrian Wright from lights to keyboards and hurriedly put together a new version of The League, recruiting Ian Burden and a pair of teen girls he saw dancing at a club – Joanne Catherall and Susan Ann Sulley – to provide backing vocals. After the tour, the group hurried out a single, *Boys and Girls*, before joining forces with producer Martin Rushent for their first hit, *The Sound of the Crowd*. The lineup was then completed with the addition of Jo Callis. *Don't You Want Me* is built around a massive synth riff created primarily with Roland's Jupiter-4, a skittering sequence (painstakingly programmed on a Roland MC-4), and the newly acquired LinnDrum. Initially, Phil Oakey was unhappy with Rushent and Callis' mix, but was thankfully convinced to give it a go.

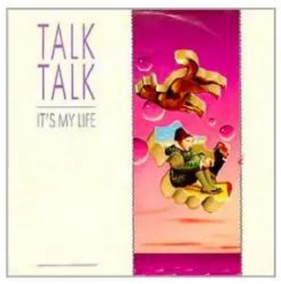
> Step by step: League lead

1 > This patch is often recreated by stacking oscillators tuned to open fifths. Given that the original Jupiter-4 had a single osc (+sub) per voice, we'll leave the fifths to you. We'll be using BazilleCM. Shut off the Delay, disconnect Osc 1 from Out 1 and send Osc 1 to a Filter input instead.

2 > Send Osc 2's Output to the other Filter Input, and find Osc 2's PD Value knob (above where it says Saw) and crank it full. Run a cable from the Filter's 24dB Output up to one of the Out 1 jacks. Locate Osc 1's Fine Tune knob (above Cents) and set that to -7.0. Set Osc 2's Fine Tune to 7.0.

3 > Set the Filter's Cutoff to 25. Run a cable from Env 2's Out up to the Filter's lower-left jack and max the knob above that jack. Go to Envelope 2. Set its Attack to 15 and the Decay to around 33. The Sustain should be set to around 41 or so, and Release should be set to 62.

4 > Next, go over to Env 1. Give its Attack slider a nudge. The Decay and Sustain settings are fine. Push the Release up to 40 for that characteristic tail-out. Fine tune as you like. Play the sound using open fifths and stick a fat bass patch under your left hand for the full effect.



It's My Life

Talk Talk

Year: **1984**

Original Synth: **Roland Jupiter-8**

Plugin used: **DuneCM**

> Released in 1984, the title cut from Talk Talk's second LP wasn't a big hit... initially. Though it reached the Top 40 in the US, it stalled at number 46 in the UK. A subsequent re-release fared even worse, barely entering the Top 100. However, after being re-reissued alongside an anthology LP in 1990, it reached number 13, the best the band ever managed at home.

A sublime slab of new wave, *It's My Life* features a series of unusual sonic effects over chiming guitars, and shimmering pads over a throbbing bassline, all in service to Mark Hollis' Roy Orbison-meets-Bryan Ferry vocals.

Buoyed by the success of their new wave and synthpop records, Talk Talk would eventually shift toward a more experimental, arty sound, exemplified by their critically-lauded and influential fourth LP, *Spirit of Eden*.

It's My Life would once again enter the charts (and win a Grammy) when covered by American group No Doubt, as sung by Gwen Stefani.

> Step by step Jovian pad

1 > It's the chiming Jupiter-8 pad in the chorus that stands out. We can create a similar sound with Dune CM, starting with an Init Patch. Choose square waves for all three oscillators. Set Osc 1's Semi to +24, and Osc 2's to +36. Set Osc 1's Fine to -20 and Osc 2's to 20. Osc Mix should be 48%.

2 > Set the Osc 1's Fat knob to 14% and Osc 2's to 30%. Bring Osc 3 up to 64%. Set the Filter's Cutoff to 55%, and Reso to 17%. Env should be 40% and Key Track 60%. Change the Filter mode to LP Ladder 24dB. Our sound is rich but static. We need to shape it.

3 > In the amp envelope, the Decay should be 66%, and the Sustain 59%. The Release should be 62%. On the filter envelope, Decay should be set to 69% and Sustain to 63%. The Release will need to be lengthy, so set it to around 62%. This gives us the sort of bell-like fade out.

4 > Sounds good but it's missing that most 80s element, the reverb! Use Acon Digital CM Verb and its Medium chamber program. We'll nudge the Dry level down and increase Reverb time for a lovely, thick pad. We've been heavy-handed with the 'verb. Tweak yours as you like.

Computer World

Kraftwerk

Year: **1981**

Original Synth: **Moog Minimoog**

Plugin used: **ZebraCM**

> The robots return, this time with a paean to an automated environment. If only they could have known what the future actually held. Scratch that, maybe they did, given the way we now produce music with computers! *Computer World* was the third single from the album of the same name, a lively, jaunty concoction of bleeps, whirs, hisses and pops. 'Pop' all around, really; unlikely given the lyrics' concern with business, authority, and a suggestion that we are all dominated by the omniscient computer. But delicious pop! Percolating sequences, tinkling leads, and that ever-present, snappy backbeat, from the mighty Minimoog. Eventually used to death by industrial musicians, this resonant percussion would become all-too familiar. Here, however, Kraftwerk use it to inject their song with a relentless purpose.

> Step by step Resonant zap

1 > u-he's ZebraCM can recreate the classic zap. Start with the default patch, mix the Volume of both oscillators, activate Noise, bringing its Volume up. Choose the LP Vintage Filter mode, crank the Cutoff fully and Key Follow down. Resonance and Env2 will be fully cranked.

2 > Kill the Velocity of both envelopes, reduce the Sustain of Env1 to nil. Env1's Decay should be set to 30, and its Release to 15, Attack is 0. Env2's Attack and Sustain will likewise be 0. Its Decay will be set to about 23. Release will be 33. These give us the classic zap. Tweak to taste.

3 > Beneath the display, we'll Pan our sound fully right. Go to lower-left of the Mix & FX section and activate the Delay1 effect. In the Delay section, choose 1/32 Delay Times and reduce Feedback and X-Back to nil. Pan controls will be set to the right. Layer it with a clap for best effect.

INDUSTRIAL

Aggressive, experimental and often atonal, this unapologetic assault on culture enchanted the disenchanted, and influenced the very mainstream it despised...

> For many, the term 'Industrial' conjures the tuneful primal scream behind Nine Inch Nails or in-your-face aggro of Ministry. For others, the moniker is forever linked with the electronic body music of Front 242. Yet, as a genre, it was initially harder to pin down than its familiar form of the late-80s.

Monte Cazazza coined the term to describe the art-noise of bands like Throbbing Gristle. Bleak, hopeless, dystopian, and with the faint whiff of desiccation, early industrial music could at turns sound like a symphony of printing presses or an unashamed nod to Tangerine Dream – and just about anything in between.

Industrial music in its most familiar form wouldn't happen until the art-noise contingent began adding drum machine-derived rhythms. Ex-Throbbing Gristlers Chris and Cosey predicted the future with *Trance*, while Cabaret Voltaire shook Sheffield with the unlikely funk of *Sensoria*. Severed Heads and SPK were there, too, the former creating an unlikely dance-floor classic, the latter reaching for accessibility.

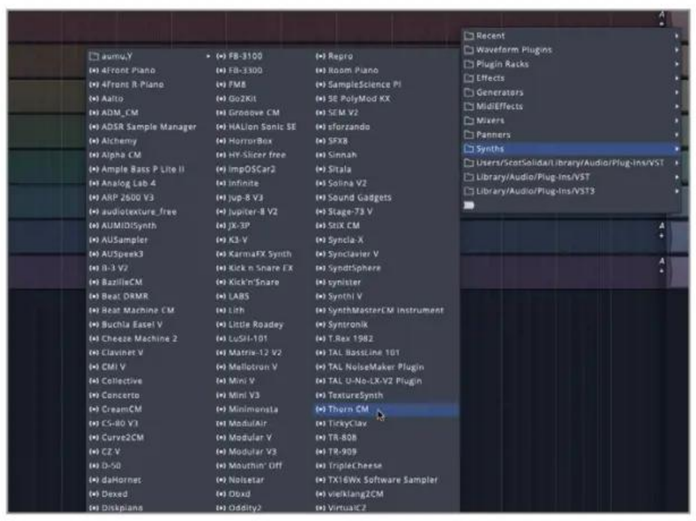
By the late 80s, many defining bands gained popularity, with Skinny Puppy setting the stage with horror movie samples, unusual beats and shock theatre. The guitar-driven junkie growl of Ministry and emotionalism of NiN – and booty-shaking beats of Front 242's *Headhunter* – re-drew the map others would follow.

Let's make a track with the software and samples at filesilo.co.uk (Bookazines/ Music Producer's Guide To Electronic).

>Step by step

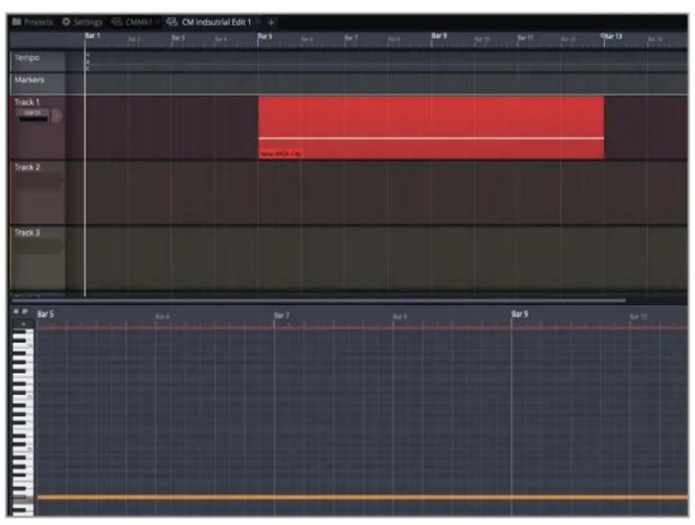
1. Banging beats and riveting rhythms

1 > In this tutorial, we'll be whipping up an old-school Industrial track in the predominately electronic style of bands like Frontline Assembly, Klinik, and A Split Second, but with modern touches. Use your preferred DAW, but, as in the previous section, we're using Tracktion Waveform Free. You can grab that (for free!) from www.tracktion.com.

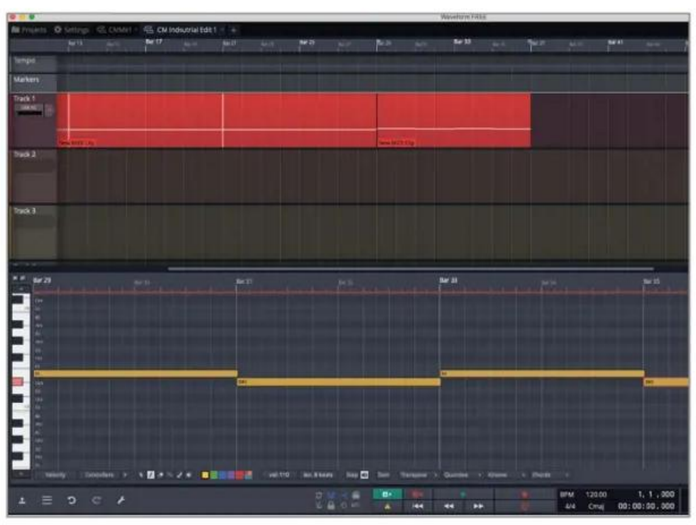


2 > The best-known industrial bands leaned heavily on powerful rhythms, often from unconventional sources. We'll start with a rhythmic sequence, courtesy of Thorn CM, which we'll instantiate on track 1. In Waveform, this is done by dragging the grey "+" widget into the track's Outputs panel on the right, left of Volume. Select the plugin from the menu.

3 > Thorn CM is a keen synth/sequencer combo with a preset that will perfectly suit our needs. Find it in the instrument's preset browser in the upper right. Open the Seq submenu. Find a patch called Glitch Elastic. If that sounds too modern, rest assured, industrial musicians were making glitchy sounds long before anyone thought to give it a name!



4 > Create a new 8-bar MIDI clip at the start of bar 5, track 1. In Waveform, do this by dragging the red '+' to the desired position, wherein you'll be given the option of creating a new MIDI clip. Double-click the clip for an expanded view. You can record or draw in the note data. In this case, it'll simply be a single, sustained C#3 note over the entire eight bars.



5 > Click the 'L' button in the clip's header to loop it. Now, using the handle on the upper-right, drag it out to the end of bar 28. This clip will be our intro and 'verse' section. We'll fill in those first four bars later. Create another 8-bar clip at bar 29. This one will consist of two bars each of E3 and D#3, repeated. This bit will act as a 'chorus' section.

6 > We'll name our track, calling it GlitchSeq. Now we'll move to track 2, into which we'll drop an instance of Dope VST's Beat Machine CM. We'll dial in the preset called [1] Lost Cannon. This will give us a powerful sampled kick drum. Create a looped 2-bar clip and enter hits (C2) on every down and backbeat. Embellish with rapid-fire 16ths at the start of each bar.

>Step by step 1. Banging beats and riveting rhythms *(continued)*

7 > For ease, use the same kick clip for both verse and chorus. But we'll create at least two different snare clips. First, we need a snare. Open StiX CM on track 3. Click the Snare button in the top-left for its parameters. Using the Drum Preset browser, find the Snare category and then load SN Sample Overtone LtZ.

8 > That's a good sound – less like a snare, more like a bit of scrap metal! Create a 2-bar clip for the verse section. Here, you'll just be laying snare hits on the backbeat. Predictable, but necessary! Now create another 2-bar clip for the chorus. This time, add a couple of extra hits to add a bit of energy and interest.

9 > Bring another instance of Beat machine CM in, putting this one on track 4. The preset called Koolish has an effectively metallic hi-hat sound. Create a 2-bar clip and play or draw in a persistent rhythm. Create a variation for the chorus section or use the same pattern throughout. We've chosen the former.

>Step by step 2. Bass

1 > Now we've got a basic beat, let's add bass. Industrial basses were often busy, staccato affairs. Cabaret Voltaire might use a bit of funk; others were downright robotic. Sounds were often from analogue synths but sampled basses and digital sounds were popular, too. Again, instantiate a new Thorn CM track.

2 > We'll go for something brazenly digital, and Thorn CM has just the thing. It's called Chrome and is found in the Bass category presets. This patch sounds a bit like a cross between a classic FM bass and those made famous by the PPG Wave. Create a 2-bar MIDI clip and draw in a busy pattern as seen here.

3 > We've looped the new clip and stretched it to the end of bar 28. When satisfied with your 'verse', it's time to move on to the chorus section. In our example, we've created a much longer clip – eight bars, in fact. As with the GlitchSeq clip, we've repeated an E and D# pattern with occasional embellishments.

FOUR INDUSTRIAL CLASSICS

THROBBING GRISTLE
20 JAZZ FUNK GREATS
TG can't be pinned down to a single example. From the aggro *Discipline* to the poppy *Hot On the Heels of Love*, this one is a confusing, diverse masterpiece.

bit.ly/tg_bh

SKINNY PUPPY
MIND: THE PERPETUAL INTERCOURSE
The Canadian scaremeisters' third full LP, *Mind:TPI* is at times difficult, angry, wistful and terrifying. Wonderfully weird.

bit.ly/skppy_mtpi

FACTRIX
SCHEINTOT
So terrifying is this melée of beatboxes/feedback-laced guitars, we hesitated to include it. Hailing from a time when industrial/goth was less a genre than an attitude.

bit.ly/fctrx_schntt

MY LIFE WITH THE THRILL KILL KULT *I SEE GOOD SPIRITS, I SEE BAD SPIRITS*
Funny, filthy, and with some catchy riffs, the Chicago Wax Trax outfit made some classic industrial slabs before ditching dystopia for disco.

bit.ly/mlwttkk_isgs

PRO TIPS

TALKING POINTS
Dialogue snippets are a staple of Industrial productions. Sci-fi and horror movies on VHS were popular resources, as were televangelists. Early samplers were costly affairs, so industrial musicians latched onto lo-fi toy keyboards and cut-priced samplers such as Ensoniq's 8-bit Mirage, and it wasn't unheard of to use tape or a looping digital delay unit. Little attention was paid to copyrights then, but in these more litigious times, we'd advise you to stick to flicks in the public domain!

ABRASIVE ACTIONS
When making an industrial track, there are three words to note: distortion, distortion, distortion! While a typical rock act might apply liberal distortion to guitars, industrial bands slathered it on everything, notably vocals. This was aggressive, unfriendly music; the idea of perverting a typically appealing sound was top of every industrialist's mission brief.

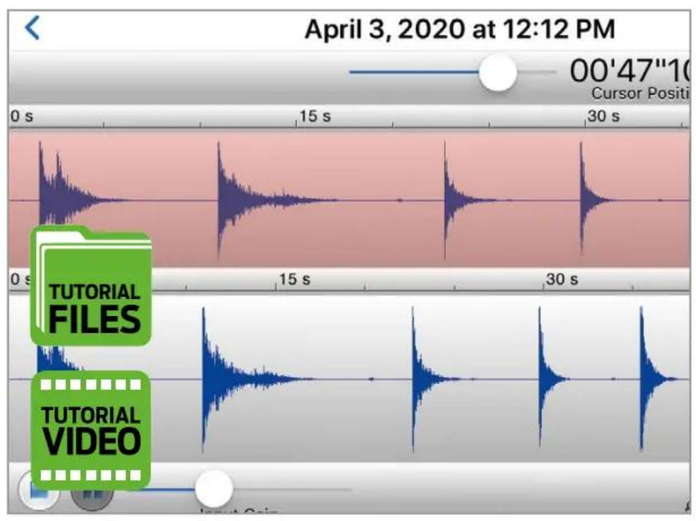
Dystopian dissonances

Industrial music is meant to disturb. Art terrorism taken to the extreme and reflected in the fashions of its fans. It was as nihilistic as punk, but with an intellectual bent, fuelled on apocalyptic science-fiction and a fetish for machinery. It embraced taboos such as psychopathy, sexual deviance, the occult, and – on rare occasions – fascism.

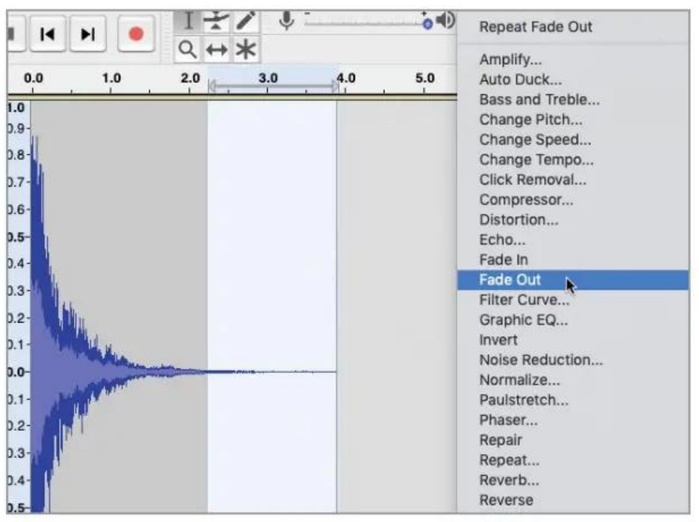
These disturbing subjects were reflected in the music as well as the sound design. Industrial music was often favoured by untrained musicians who hadn't a clue about song structure, metre or key signatures. And when musos got involved, they intentionally eschewed any formal music theory, choosing instead key-less, dissonant juxtapositions. Songs were often built on a single chord, and even then, dissonant notes were usually introduced. Vocalists rarely sang, but instead grunted, growled, shrieked and screamed their lyrics – which were almost always bleak and with a cautionary tone.

In other words, forget what you know, or wilfully flaunt your ignorance. This music is not about melody or harmony – quite the opposite, in fact!

> Step by step 3. DIY samples



1 > Industrial music is chocked full of found sounds. We found two pieces of metal tubing and took them into an empty concrete room where we whacked 'em together a few times. The natural reverb was ideal. We recorded it in a decidedly lo-fi (if anachronistic) manner, using an iPhone and the built-in mic.



2 > We're going to drop our file into the beginning of the song, trimming it down to a couple of nice-sounding hits. We'll open the same file in an audio editor and select the best hit, trimming off the rest. We'll fade the tail a bit and export it as a new file.

3 > Because copyright is a concern, we'll 'roll our own' sampled dialogue. We'll use a cheap hand-held mic and say something suitably creepy. We'll record this bit onto a new track close to the song's start. We can add to the dark mood by lowering the pitch of the sample by five semi-tones or more.

4 > We'll create another sample, using CM EQ-UA87 to make a 'telephone' effect. We'll drag the sample into an instance of Loomer CumulusVST. Next, we'll put a few slice markers in and tweak the parameters. We'll play it straight a couple of times, but also create another clip where the sample stutters and glitches.

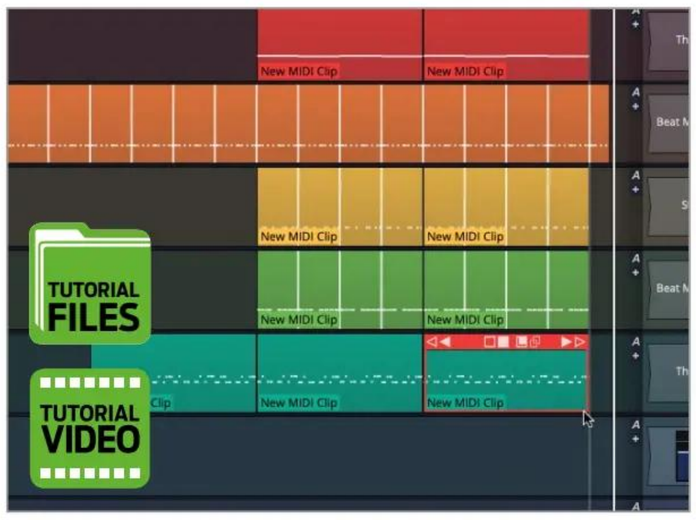
> Step by step 4. Vocals

1 > Our track is just a bit sluggish at the default BPM, so we're going to nudge our tempo up to 125 while we still can. Waveform will dutifully push everything into its proper position for us. Next, create a new audio track and grab a mic. It's time to track some vocals!

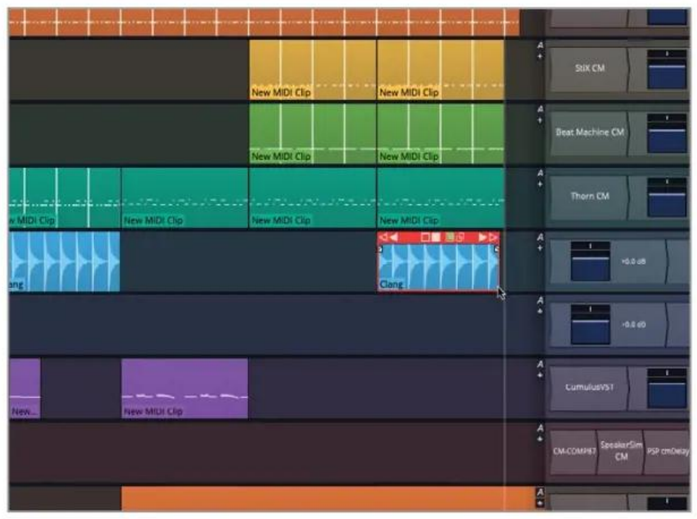
2 > Classic industrial vocalists grunted, growled, and grumbled. We'll growl a few unsettling words that reflect the anxiety of our times. Don't worry if your voice sounds goofy – we'll render it all but unrecognisable in the next walkthrough. For the purpose of our demonstration, we've tracked only a single verse.

3 > Let's add some effects. Start by compressing the track with the CM-COMP 87 using a Ratio of 7:1 and a Threshold of -17dB. Bring in SpeakerSim CM, selecting the Walkie Talkie. Boost the EQ's mids. Finally, stick PSP's cmDelay on, using the Basic Short Delay patch. Turn Sync on and set Delay Time to 1:16.

> Step by step 5. Arranging and mixing

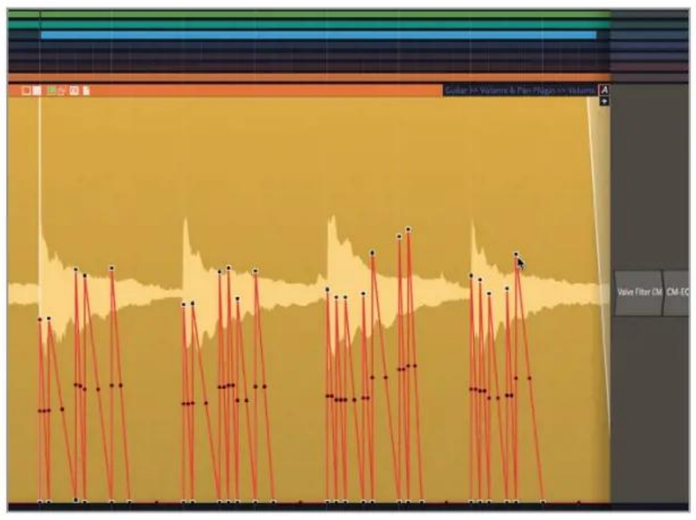


1 > Finishing touches time. Instantiate Alpha CM and load up the preset called Cold Pad. Play and hold a droning chord for the first 16 bars. Put the dialogue snippets over the intro pad for dramatic effect. Introduce instruments gradually, alternating verses and choruses, dropping instruments in and out.



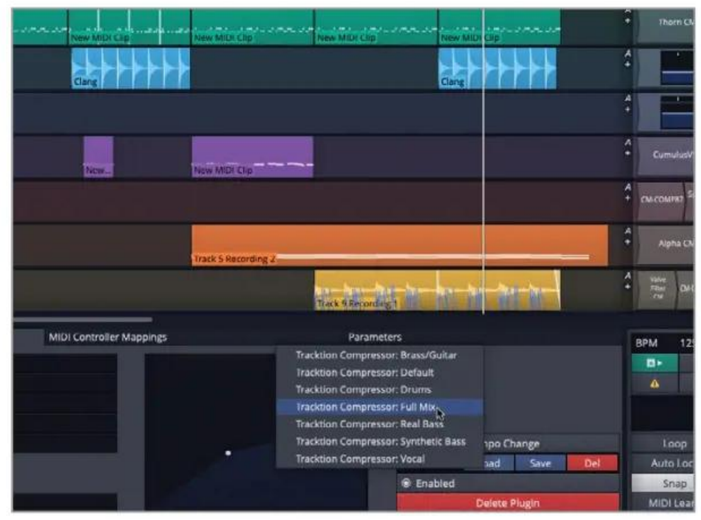
2 > It's a bit too stark in the middle bit, so add the bass back in. Remember those single clangs we edited? Put them there, on every other backbeat and do the same for the last eight bars. It might be effective to have our pad double the choruses in the latter half of the song.

3 > There's still something missing at the end. Maybe we need something more organic – say, a guitar? Let's record a few simple sustained notes or chords over the last 16 bars. Add drive with Valve Filter CM. Use CM-EQUA 87 to reduce lows and boost mids. Stark CM's Rich Chords preset adds the final touch.



4 > The guitar is a bit too overwhelming. We like the timbre, but it takes up too much space. We can fix that with some meticulous volume automation. We'll create an interesting rhythm using Waveform's automation curves, making sure the volume 'peaks' are in sync with our bar lines and beats.

5 > Our guitar track sounds cool, but it can be even cooler with an instance of PSP's cmDelay. Drag one in, but place it after the track's volume fader so that it is unaffected by our automation. Call up the 'C>L>R' preset and activate the tempo sync. Now set the Delay Time to 1:8.



6 > It may be wise to walk away for a bit to give your ears a break before performing your final mix. A good approach is to bring all the levels down, then loop various busy sections, mixing each in turn. Some engineers will stick a compressor on the master bus while they mix it.

Subversive sounds

Rock 'n' roll has always embraced aggressive and even atonal sounds at times – the barely contained feedback squall that opens The Beatles' *I Feel Fine* being one example – but industrial artists went much further, producing sounds that were intentionally abrasive and even at times painful. Whereas rock artists might use feedback as an occasional accent to the main event, Industrial musicians might make it the dominant sound throughout the arrangement.

Further to that, industrial artists often refused to be limited to traditional instrumentation, choosing instead to create their cacophonous rhythms by banging on oil cans, girders, pipes, just about anything that might produce a thud or clank. Groups like Test Dept. and Einstürzende Neubauten performed in scrapyards, abandoned buildings and built their own instruments from found or salvaged objects.

This approach took a massive leap forward when samplers entered the scene. SPK's Graeme Revell sampled printing presses and other machines for SPK's *Zamia Lehmani* LP and even went so far as to create an entire album from insect noises for his aptly-named solo effort *The Insect Musicians*.

POWER TIP

> No-Fi

The production style of industrial ranges from the very lowest fidelity to full-blown studio productions and everything in between. The earliest bands often recorded on two and four-track cassette machines, while bands like Skinny Puppy and Ministry made use of all of the technology of the then-modern studio. Most bands worked somewhere in between. Thanks to early MIDI sequencers and multi-timbral synths and samplers, full arrangements could be created without heading to the studio. However, Industrial acts often took perverse joy in eschewing any semblance of commercial production values.

Billie Jean

Michael Jackson
Year: **1983**
Original Synth: **CS-80**
Plugins used: **Dune & ThornCM**

> Not many songs are instantly recognisable just from a couple of synth chords, but *Billie Jean* is one. The song remains one of the biggest singles of all time with over 10 million copies sold to date.

Co-produced by the legendary Quincy Jones alongside the king of pop himself, the song is a masterpiece of music production thanks to its stripped-back grooves, unique drum sound, clever recording techniques (backing vocals sung through a cardboard tube, anyone?) and creative use of then pioneering music tech. Even the mix by Bruce Swedien, who normally nailed his mixes in one take, was done over 90 times.

The iconic, string-like chords in the intro were laid down by Jackson using a Yamaha CS-80 alongside a splash of reverb for effect, and we'll be using DuneCM alongside ThornCM to create our own version.

> Step by step Intro chords

1 > This was created using two distinct preset voices on the Yamaha CS-80 (String 1 and Brass 2). We'll take a pair of synths to mimic it, so load DuneCM and ThornCM on separate channels. Open DuneCM and String Section preset. Reduce the channel to -6dB to balance the volume.

2 > The original has a more staccato feel than this string preset, so reduce the Amp Env Release to 35%. Turn to the brass layer. Open ThornCM, and load the PAD Brass preset. Increase the Max Voices from four to eight, so ThornCM doesn't run out of voices on the third chord.

3 > Disable the onboard delay and reverb effects, then reduce output Volume to 15%, so our two layers are balanced. Reducing the Amp Env's Release to 25% gives a tighter sound to our layered synth combo. Reducing Filter Cutoff to 150Hz lets the string patch shine.

4 > Change ThornCM's Master Tuning to -24, so the patch shifts down an octave for thickness. Add reverb to glue the patches. Group both synths, and add HY-FX CM. Choose the reverb preset, and set Decay to around 8 o'clock. Set Wet/Dry to around 20% to finish.

1999

Prince
Year: **1982**
Original Synth:
Oberheim Four Voice
Plugin used:
ThornCM

> Perhaps the only song ever to have its video played for 24 hours straight, courtesy of a VH1 stunt to welcome in its namesake year, *1999* was originally released as a single in 1982.

The song made heavy use of the many synthesisers and drum machines installed at Prince's Paisley Park studio. It's quite likely that the sound was actually an Oberheim preset as, according to longtime collaborator Lisa Coleman, Prince had a tendency to "just use a preset, and brighten the f**k out of it!". The introduction lead part has a brassy, shiny texture to it, and it would have been played using an Oberheim Four Voice keyboard.

Now, let's make our own version of this iconic tone, once again using the excellent ThornCM plugin...

> Step by step Intro lead

1 > Start by setting Osc 1 to the Organ 01 waveform. Pitch the osc up by an octave, giving our patch a sharp tone. Turn on Osc 2 and select the Pulse Sweep waveform. This adds thickness and depth. Reducing the Amp Sustain to 45%, and Release to 20% tightens the sound's envelope up.

2 > Modulate the pulse width of both oscs using an LFO, for subtle movement. Set the FX Type of both oscs to Pulse-Width Modulation, then assign LFO1 to both dials. Change LFO Speed to ¼ notes, so the sound is less warbly. Set Filter Mode to CleanLP, Cutoff around 9kHz.

3 > Reduce Master Vol to 20%. Add reverb, increase Filter Res to 40%, then push Drive to 6dB to make up lost gain. Add Reverb at 10%. Push the reverb Treble control to 100% to disable high freq damping, for a brighter sound. Reduce Speed to a slow 8/1, then set the Modulation to 60%.

Chime

Orbital

Year: **1989**

Original Synth: **Yamaha DX100**

Plugin used: **Thorn CM**

> One of UK dance music's most seminal early records, *Chime* was the first single released by the Hartnoll brothers under the name Orbital, and reached number 17 in the UK singles chart following its re-release on Pete Tong's FFFR in 1990 – not bad for a record quickly knocked up before a trip to the pub! Originally recorded in their home studio, which was under the staircase of all places, *Chime* was mastered onto the Hartnoll family cassette tape player, which ran a little too quickly, making the final record slower than intended – an anomaly that wasn't fixed until the Orbital boys re-recorded the track in a professional studio for the re-released version a year later. As with many rave records made at the time, *Chime* combines a selection of samples taken from an old instrumental record with synths, alongside a drum machine track. We're focusing on the chunky bass taken from a Yamaha DX100. So, let's run through how to make our own homage to this sound using the brilliant ThornCM.

> Step by step *Chime* chunky bass

1 > Set Osc 1's waveform to FM 05, a similar timbre to the sound we're recreating. Next, pitch the oscillator down by an octave, so the sound sits in the right register. We'll increase the Unison Voices to 2, and push the Detuning amount up to 10 to thicken the sound.

2 > Set Osc 1's Phase mode to Gate to make it consistent, as the oscillator starts the wave at the same place for each note. Turn on Osc 2 and choose the square wave. Turn the Volume down to 0, then increase Osc 1's FM Amount to 62, using Osc 2 to modulate the frequency of Osc 1.

3 > Turn on Noise generator, and set the Vol to 30%; this adds some fizzy crunch. We'll turn on the distortion effect, select the SoftGain preset and reduce the Mix to 20%; this adds saturation, giving the sound a rounded tone. Next, shape with the filter – choose Dirty LP.

4 > Set the Cutoff to 200Hz, and the Res to 40%. Increase the Env 1 Amount to 20%, so the filter is modulated by the envelope. Reduce Env 1 Sustain to 0% to make the modulation subtle. Increase Filter Drive to 10dB; this makes up the gain lost from applying the filter, while adding crunch.

The Final Countdown

Europe

Year: **1986**

Original Synth: **Roland JX-8P, Yamaha TX816**

Plugin used: **DuneCM**

> Inspired by Bowie's *Space Oddity*, Joey Tempest of the Swedish band Europe wrote the main riff for *The Final Countdown* on a borrowed Korg Polysix way back in '81, eventually demoing it for his bandmates in '85. They weren't impressed, with guitarist John Norum singling out the now-iconic synth intro as a sticking point. Luckily, Tempest stood his ground and the band cut the song, on which the keyboardist employed a Roland JX-8P and a preset from a Yamaha TX816 to create the opening fanfare.

The band never intended *Countdown* to become the lead single from the album of the same name. Their label had other ideas and it was released to a rapturous record-buying public, eventually scaling to an impressive number 8 on Billboard's Hot 100.

> Step by step Synth brass

1 > Starting with Dune CM's Init Patch, we set our Osc Mix to 55% and Osc 3's Level to 39%. Opening Mod Matrix 1>12, we set both Source 2 and 3 to Mod Env. Dest 1 is Osc 1 Fine, and Amount 2 +50. Dest 2 is Osc 2 Fine, Amount 2 at -50. Source 4 and 5 are LFO 1 and LFO2, respectively.

2 > Dest 4 and 5 are Osc 1 Fine and Osc 2 Fine, respectively. Amount 4 is +5, Amount 5 is -7. LFO1's Rate is 0.2Hz, LFO2's is 0.1. In the Filter, Cutoff is 37%, Env is 75%. Key Track is 36%. Amp Env's Attack is 19%. Filter Env's Attack is 26%, Decay should be 18% and Sustain will be 66%.

3 > The Mod Env's Attack and Decay should both be set to 30%, Sustain shut off. Not bad, but go back to the Filter and select LP Ladder 12dB for a vintage sound. Put PSP's cmDelay on, with ¼-note synced echoes, the Wet signal down. A bit of Acon Digital CM Verb might be nice, too!

Sweet Dreams (Are Made Of This)

Eurythmics

Year: **1983**

Original Synth: **Oberheim OB-X, Roland SH-101**

Plugin used: **Dune CM**

> Eurythmics' hit single seemed to come out of nowhere, yet the road to success was long and arduous for the duo of Annie Lennox and Dave Stewart.

Having met in 1975, the pair initially played together as members of The Catch, a punk outfit that would eventually morph into a five piece pop/new wave band The Tourists, with whom they'd cut three LPs. Despite some success with the band, tensions within the group and the artistic constraints of a band left Stewart and Lennox dissatisfied and determined to carry on as a duo, bringing in various collaborators as and when needed.

Calling themselves Eurythmics, they debuted with *In the Garden*, recorded with Conny Plank in 1981. Contributors to the LP include Can's Holger Czukay and Jaki Liebzeit, D.A.F.'s Robert Görl, and Blondie's Clem Burke.

A hybrid of electronic, post punk, and Krautrock, this rather fine debut was all but overlooked, leaving Lennox and Stewart to rethink their approach. They decided to retain the name, but to go it alone.

As such, *Sweet Dreams (Are Made of This)* is by necessity an exercise in restraint. After the commercial disappointment of their previous album, the duo sequestered themselves away in a small project studio they'd outfitted with the help of a bank loan. There they toiled away with the merest handful of secondhand synths, an 8-track recorder, and a single microphone.

Built around a rhythm bed created with their recently acquired Movement Systems Drum Computer, purchased with yet another loan, *Sweet Dreams...* is built on a simple bass sequence from a Roland SH-101, over which Lennox was inspired to play another part on a borrowed Oberheim OB-X. The latter began as a stock strings patch, tweaked for a faster attack. These sounds are panned in the final mix. It's the combination of these two sounds that form the memorable riff heard throughout the tune.

> Step by step *Sweet Dreams* main riff

1 > We'll be using Dune CM to recreate the main synth riff from the classic Eurythmics track. We'll start with an Init patch, and set the Osc Mix dead centre. We'll choose a square wave for Osc 1, and nudge both Fat knobs to 9%. In Osc Common, we'll set the P/Width to 19%. Clicking Mod Matrix 1>12, we'll choose LFO 1 for the second Source.

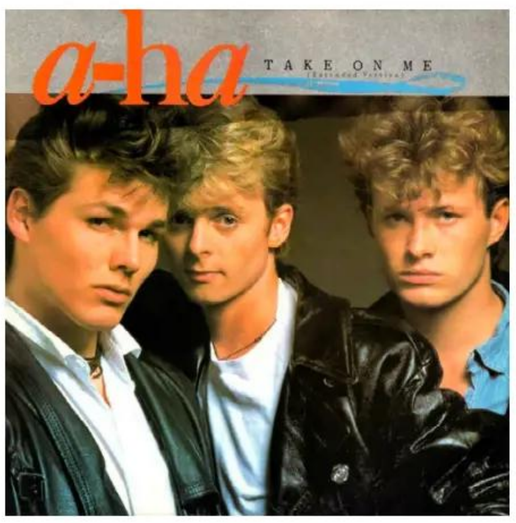
2 > We'll select Pulse Width from the Osc Common menu as the destination, with an Amount of 74%. Going to LFO 1, we'll set its Rate to 0.02Hz. We'll set Osc 1's Fine tuning to -0.4, and Osc 2's to 0.4. In the filter section, we'll crank the Cutoff fully down and Key Track fully up. The Env amount should be 72% or so.

3 > We'll set the Amp Env's Attack to around 11%, Decay and Sustain to 68%, and Release to 47% or so. The Filter Envelope's Attack should be 23%, Decay and Sustain at 88%, and Release should be set to about 68%. That gets us the main riff sound. Now we'll pan it hard right, just as it was in the original.

4 > We'll use AlphaCM for the bass. Open the preset browser and choose Z-Init. Set both Osc's Wave fully to their A waves. Select Square1 as Osc 1's A wave. Set its Detune knob to just over 9 o'clock. In the Matrix, we'll select LFO 1 as the first mod source, and Osc 1 Symmetry as its destination, with an amount of 1.00.

5 > Clicking the LFO's Rate display, we'll select Off to detach it from host sync. We'll set its frequency to 0.42. In the matrix, we'll select Note as another source, with Filter Cutoff its destination. Amount will be 0.3350. In the Filter, we crank the Cutoff knob fully down, and set the Filter Envelope Depth to 3 o'clock.

6 > The Filter Envelope's Decay should be at 11 o'clock, and its Release at 2 o'clock. The Amp Envelope's Decay and Sustain knobs should both be at around 10 o'clock, and the Release just under 11 o'clock. That's about it for the bass patch. It should be panned hard left and mixed against the main riff. A bit of reverb wouldn't go amiss!



Take On Me

a-ha

Year: **1984**

Original Synth: **Roland Juno-60**

Plugin used: **Alpha CM**

> Remember the children's book about the little train engine that just couldn't seem to get up that hill? a-ha must have taken its tale of perseverance to heart, as their signature hit went through multiple bands, titles, revisions, and releases before finally becoming one of the most memorable tunes of the 1980s.

Pre-a-ha, guitarist Päl Waaktaar and keyboardist Magne Furuholmen had a band called Bridges, with whom they wrote a song called *Panorama* which became *Miss Eerie*, and it contained a certain familiar synth riff.

After Bridges disbanded, they joined forces with singer Morten Harket as a-ha and together they did a version of *Miss Eerie* – now renamed *Lesson One*. This new version would be retitled yet again as *Take On Me*.

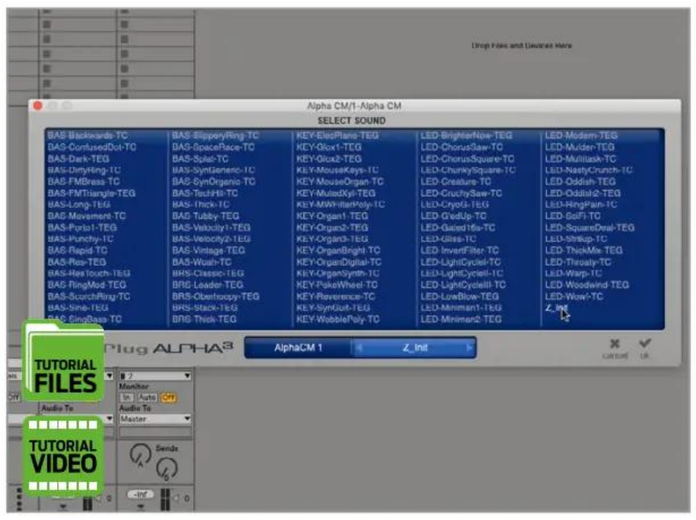
The new group recorded a demo of the tune, re-recorded it with producer John Ratcliffe, and eventually inked a deal with Warner Bros UK. After an unsatisfactory mix from producer Tony Mansfield, the song was re-mixed yet again and finally released to an uninterested public, reaching 137 on the UK singles chart.

At this point, Warner Brothers America offered to finance yet another version. This latest attempt was built around a LinnDrum beat, a DX7 bass, and PPG Wave. The main riff was played on a Roland Juno-60, and doubled with another synth – possibly a DX7.

WB America released this latest version along with a music video of the band performing... only to meet the same indifference.

At this point, any sane persons involved should have cut their losses. However, producer Alan Tarney gave the song a once-over and an innovative new video was commissioned from director Steve Barron. The rest, as they say...

> Step by step *Take On Me* Juno patch



1 > We don't have the space to recreate both the analogue and digital constituents of this patch, but as the Roland Juno-60 was front-and-centre of the original, you get pretty close with AlphaCM, which was originally intended to resemble the Juno series. Let's load it up, and click on the browser at the bottom to locate and load the Z-Init patch.

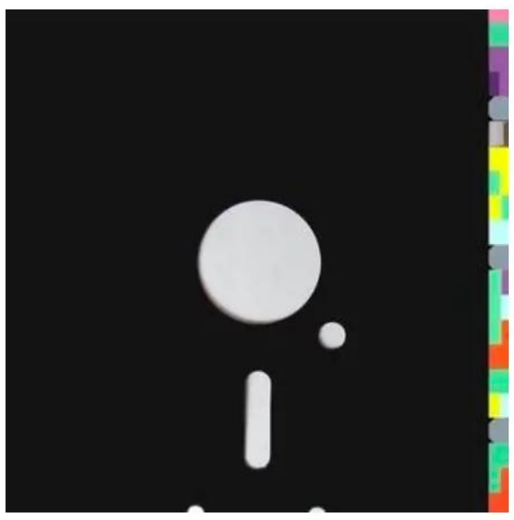
2 > We'll start by building up our waveforms. Going to Osc 1, we'll select the wave called Square2 as our B wave, and we'll set the Wave knob to around 2 o'clock. Next, we'll push the Detune knob up to the 10 o'clock position. Now, for Osc 2. Here, we'll select Square1 as the A wave, and Sawtooth as the B wave.

3 > We'll set Osc 2's Wave knob to 1 o'clock or so. Let's reduce the octave of Osc 2's A slot to -1. Now, let's go to the Mix section and set the Mix to a little past the 10 o'clock position. That's the oscillators sorted. Moving on to the filter section, we'll click the 24 button. Let's set the Cutoff to just under 10 o'clock.

4 > We'll likewise set the Res to just under 10 o'clock. In the matrix, we'll choose Note as a mod source and Filter Cutoff as its destination, with an amount of 0.74 or so. Back in the filter, we'll crank the Envelope Depth Knob nearly full. We'll set the Sustain to just past 11 o'clock, and the Decay to about 10 o'clock.

5 > Next, we set the Filter Envelope's Release to just over halfway. Moving to the amp section, we'll set its Decay to just below 2 o'clock, Sustain fully down, and Release to just past the 10 o'clock mark. This gets us close to the characteristic pluck sound of the original tune, but there's still something missing.

6 > As you might have guessed, we need to activate the chorus effect, as it was a big part of the Juno sound back in the 1980s. We'll crank the Wet knob up to the halfway mark. We'll set the Time to 1 o'clock, and the Rate to 3 o'clock. Ah, that does the trick, getting us much closer to the original patch.



Blue Monday
New Order
Year: **1983**
Original Synth:
Moog Source
Plugin used:
u-he Bazille

> As most of you will surely know, New Order were created by the surviving members of Joy Division after that band's frontman, Ian Curtis, took his own life in 1980. Bassist Peter Hook, guitarist Bernard Sumner and drummer Stephen Morris had – along with Curtis – vowed not to use the name Joy Division should any member of that band depart, so the remaining trio assumed a new moniker and added a new member, Morris' girlfriend Gillian Gilbert, on keys and second guitar. Sumner was assigned vocal duties on the basis that he could comfortably alternate between singing and playing his guitar.

The band's first single, *Ceremony*, was composed during the final days of Joy Division and carries on that band's post-punk style, as did the band's first album of newly-penned songs. However, a trip to New York introduced the band to new dance music, including Italian disco. Electronics and dance elements began to play increasingly prominent roles with each successive release.

Blue Monday itself quite literally originated in the club scene. The band's label opened the now-legendary Haçienda in 1982, and the opening night saw New Order play a lengthy number that included elements that would later be recycled in their biggest hit.

Recorded in 1982, *Blue Monday* was propelled by a stomping kick drum from an Oberheim DMX drum machine, an out-of-sync sequencer line, and choirs (allegedly) sampled from a Kraftwerk album. A distinctive Moog Source bass snakes through the disparate elements. Sumner's purposely pallid croon drapes it all in a sepulchral shroud.

Not that the listeners where paying attention to the lyrics – they were too busy dancing. It sold like mad, going on to become the biggest-selling 12" single of all time.

In something of an ironic twist, the expense of producing Peter Saville's artful packaging meant that it actually lost money each time a copy was sold. Needless to say, *Blue Monday* was eventually re-issued with a slightly more conservative sleeve...

> Step by step *Blue Monday* bass

1 > It's fitting that a single that would shape the future of music would be made with an instrument that could charitably be referred to as "space age" in appearance! Moog's The Source was a garish delight in silver, orange and blue. Luckily, it sounded better than it looked. We'll be using u-he's BazilleCM to recreate this legendary bass sound.

2 > First, we'll disconnect Osc 1's Output cable from Out 1, and insert it instead into the top-left Filter Input. We'll patch Osc 2's Output to the other Filter Input. The Filter's LP24 Output will now go to the Out 1 jack previously occupied by Osc 1. Next, we'll route a cable from Env 2's Output to the Filter's lower-left Input.

3 > Go to the FX: Delay section and deactivate the delay effect. Let's start shaping the sound. Set Osc 1's Modify knob to -2 and Osc 1's Modify knob to 2. Find Osc 2's Waveform menu (it says Saw) and turn the knob above it fully clockwise. Now, nudge Osc 1's Phase knob up to around 9.

4 > Our sound is pretty burly at this point, but lacks any sort of shape. Go to Env 1 (it controls the amplitude). Set the Decay and Sustain sliders fully up. Set Release to about 23. Now let's go to the Filter. We'll set the Cutoff knob to around 42. Our sound is now all but inaudible. Don't panic! That's where Env 2 comes in.

5 > To get Env 2 in on the action, we'll need to shove the Filter's lower-left knob up to a value of around 96. This is the knob controlling the amount of modulation coming from Env 2. While we're in the Filter, we'll nudge the Res knob up to about 26 for some of the squelch we hear in the original patch.

6 > The sound still isn't quite there – we need to see to Env 2. The Attack is OK at nil. The Decay should be pushed up to about 22. The Sustain slider should be set to around 33, and the Release should be at around 29. This gives us a close approximation of New Order's Moog patch, but feel free to tweak it further!

West End Girls
Pet Shop Boys
Year: **1985**
Original Synth: **Yamaha DX7, Roland Jupiter-6, E-mu Emulator II**
Plugin used: **Dune CM**

> The formation of Pet Shop Boys was a largely unremarkable tale – *Smash Hits* journalist meets architecture student while purchasing a synth (Korg MS-10) at a hi-fi shop. The story of how their smash hit single, *West End Girls*, came to be, on the other hand, is a bit more... convoluted.

The single was recorded and released not once, but twice, and both versions were successful, one as an underground club 12", the other as a worldwide smash.

At the start, Pet Shop Boys Neil Tennant and Chris Lowe worked with famed American Hi-NRG producer Bobby O (Bobby Orlando), with whom they recorded a dozen tunes, *West End Girls* among them. On the initial version of the tune you can hear Orlando playing nearly every part, with the exception of the bassline and a single chord, both of which were provided by Lowe.

Released in 1984, this comparatively stripped-down, minimal version of the tune was a hit with DJs in San Francisco and LA and charted in Europe.

Eventually, the duo extracted themselves from their contract with Orlando and signed with EMI, for whom they re-recorded the song with Stephen Hague in the role of producer.

This time around, they tracked their synthpop/hip-hop mashup at London's Advision Studios, making use of the facility's 24-track deck and SSL console while there.

Kicking off (no pun intended) with the instantly recognisable Oberheim DMX drum machine and layered string samples from both E-mu Emulator I and Emulator II, the meticulously-programmed rhythm parts are driven along by a thick, analogue bass line. Played – not sequenced – by Lowe, the seemingly simple bass sound was created with a Roland Jupiter-6, layered via MIDI to a Yamaha DX7 percussive patch played in the lower registers. An Emulator bass drum is also there, played chromatically along with the rest.

This layered bass propels the tune along, from start to finish, the perfect underpinning for the laid-back spoken word lyric.

This time, the song was a worldwide smash, rising to the top of both US and UK charts.

> Step by step *West End Girls* bass

1 > If you've read our description, you'll know that the bass heard in *West End Girls* is anything but a simple patch, requiring no less than three instruments to create its distinctive thump. However, we can get quite close with a single instrument – assuming that instrument is one as good as Dune CM. Let's instantiate it and load up an Init patch.

2 > We'll start with our oscillators in the upper-right. Osc 1 is set to a sawtooth – and that's ideal. For Osc 2, we'll click the Sel button and use the up/down arrows below it to select wave number 14. This is more complex than usual analogue waves and will help us get closer to the stacked sound of the original.

3 > We'll use Osc 2's Semi knob to lower the pitch by 12 steps. Next, we'll set the Osc Mix to around 26%. We'll select the triangle wave for Osc 3, and set its level to about 31%. This is a pretty thick sound, and will give the filter something to chew on. Now we'll move on to that filter section.

4 > Select the Lowpass 24dB filter model to better match up to the filter on the original Jupiter-6. We'll set the Cutoff to around 28% and the Reso to about 24%. We'll set the Key Track to 27% or so. The filter envelope plays a big role in this sound. We'll set the Env Amount to around 60%. Now to shape our envelopes!

5 > Let's do the amp envelope first. There, we'll leave our Attack as is and set the Decay to 71%. Our Sustain level can be set to, oh, 64% or so. We might need to tweak this later. Now, we'll push the Release up to around 44%. We can't really hear it yet, as the Filter Env needs to be tweaked.

6 > Nudge the Filter Env's Attack up to around 9%. Now, set its Decay to 59%. Set its Sustain level to around 63%. Finally, set the Release to 61%. This gets us quite close to the sound of the complex sound of the original bass patch. Feel free to tweak it further – or even stack it with another synth of two!

> Step by step *Blade Runner* brass

Blade Runner Main Titles
Vangelis
Year: **1982**
Original Synth: **Yamaha CS80**
Plugin used: **Fathom CM**

> To say that Yamaha's CS80 synthesiser was vital to the success of *Blade Runner* may seem like an overstatement. Yet, it's hard to imagine an instrument that has become more identified with a soundtrack on which it was used. Indeed, there can be few dramatic films in which the soundtrack was as thoroughly embedded and as important to the mood as the lighting, set design or even the dialogue.

By the time he'd been tapped to score *Blade Runner*, Greek musician Vangelis had led a storied career. As keyboardist for rock band Aphrodite's Child, he'd recorded a classic of psychedelic art rock in the form of their LP, *666*. As a solo artist, he'd created some of the most memorable film scores of the 1970s and kicked off the 1980s by winning an Oscar for his work on *Chariots of Fire*.

With his haunting score for Ridley Scott's dystopian masterpiece *Blade Runner*, Vangelis crafted a sonic soundscape that perfectly described the loneliness and alienation of the futuristic cityscape and its denizens.

For his expansive and deeply emotional score, Vangelis (literally) leaned pretty heavily on the CS80, an expansive and deeply expressive instrument.

Despite being nominated for a BAFTA and Golden Globe award, Vangelis' original soundtrack was inaccessible for years, thanks to a dispute that resulted in Vangelis withholding its release. Fans settled for a recreation by recorded session musicians, named New American Orchestra. When the real deal finally emerged in 1994, it was incomplete, missing several cues that had appeared in the film.

Not that it really mattered much. By that point, the longing, wailing tones of Vangelis' CS80 had become indelibly etched into the (sub)cultural consciousness, and the CS80 was inextricably linked to the film. So much so, in fact, that a popular hardware recreation was released as Deckard's Dream, named after a scene in the film.

1 > The iconic synthetic brass patch that sets the mood in *Blade Runner* is actually a simple sound that depends heavily on Vangelis' performance and generous reverb. We'll attempt a similar – albeit simplified – patch using Fathom CM. We've expanded the Oscillator category in the Audio Components section, then dragged in two Analog Saw modules from the Alias Free sub-category.

2 > We'll open the Filters category of our Audio Components, and then the Virtual Analog sub-category. There, we find Voltage Controlled Low Pass and Voltage Controlled High Pass components. Drag one each into the patch. Run a cable from each Analog Saw module into the High-Pass filter, and then run a cable from the High Pass module to the Low Pass.

3 > Sounds pretty dull. Select a Sawtooth module to access its parameters in the lower section. Reduce the Pitch Octave to -1.0, and the Pitch Fine to -0.03. Click the Detune tab and activate the Detune switch. Now, click the other Sawtooth module and set its Pitch Fine to 0.03. Switch on Detune for this one, too. Things are starting to get a little livelier!

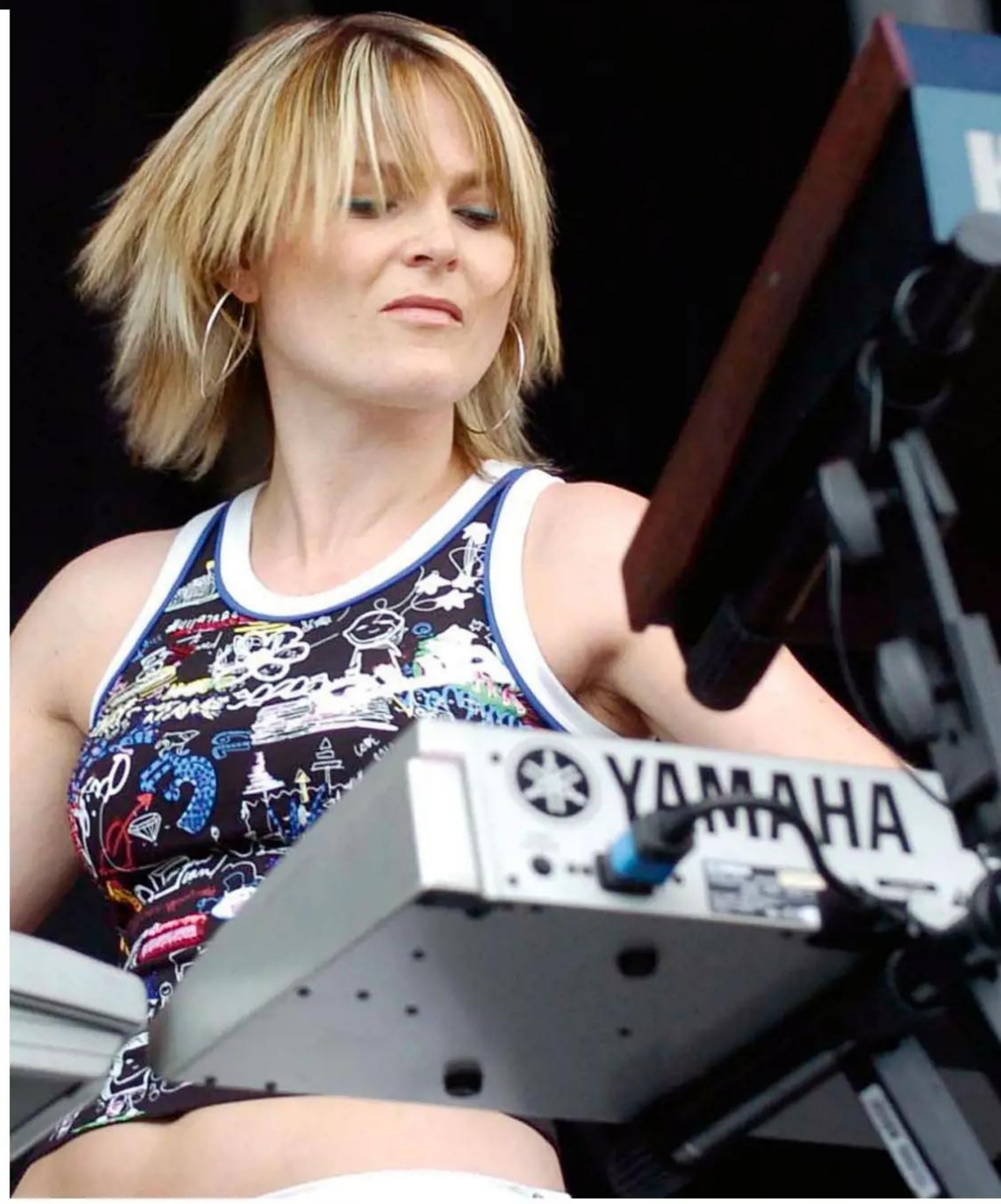
4 > Selecting the High Pass module, we'll set the Cutoff Frequency to around 600, with Resonance at just under 1.90. In the Low Pass module, we'll set the Cutoff to 24 and Resonance to 0.64. Key Track will be 0.272. Click/highlight the Cutoff Frequency knob, then click the Add Mod button. A new Modulator will be added on the right.

5 > Clicking Select Modulator, we'll select ADSR Easy from the New Modulators. Its Mod Amount should be 0.19. Attack and Decay should be about 200, Sustain at 0.38, and Release nearly full. Click the Signal Flow tab and turn master Volume down. Select the knob and use Add Mod to add another ADSR Easy modulator. Set Mod Amount to full.

6 > Set this ADSR's Attack to 20, Decay to 200, Sustain to 0.73, and Release to 232. Stick a Chorus Air component on the end, cranking up Depth and Feedback. Put a Reverb Component after the Chorus and raise its Decay Time, wet-to-dry mix. You should have a good start, but you should consider modulating Pitch and the Low-Pass cutoff with real-time controls.

The 1990s

A new generation was moving to classic synths and drum machines in the 1990s, as electronic music spread its repetitive beats from Detroit and Chicago to the mainstream. More genres, more bpms and more faceless artists than you could shake a glow stick at, this was the decade that gave the world a million reasons to dance...



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RECREATE FAMOUS 90S SYNTH SOUNDS

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HOUSE

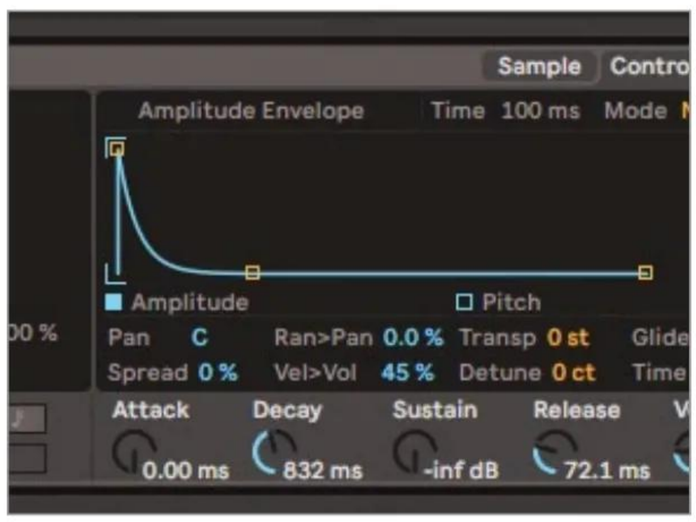
> Originating from Chicago's underground club scene in the 1980s, house has gone on to take over the world, today being one of dance music's most enduring and biggest genres. It all started when pioneers such as Frankie Knuckles, Marshall Jefferson and Farley 'Jackmaster' Funk took the template of disco music, which is characterised by 4/4 drum machine beats placed over funk-laden music, and added a more electronic, mechanical edge to it. As house grew in popularity, it splintered off into sub genres including electro house, funky house, tech house and acid house, which played a part in the birth of UK rave music styles such as hardcore and drum & bass thanks to the explosion of rave culture and the much-spoken-of "Summer of Love" in 1988.

Today's house scene caters for everyone, be it sample-based French house or synthetically-created tech house, with prominent producers right now including the likes of Solardo, Eats Everything and Gorgon City. Although the diversity of house is huge in 2020, the different sub genres have much in common, including a tempo of between 120-130bpm as well as the 4/4 beats originally inspired by disco.

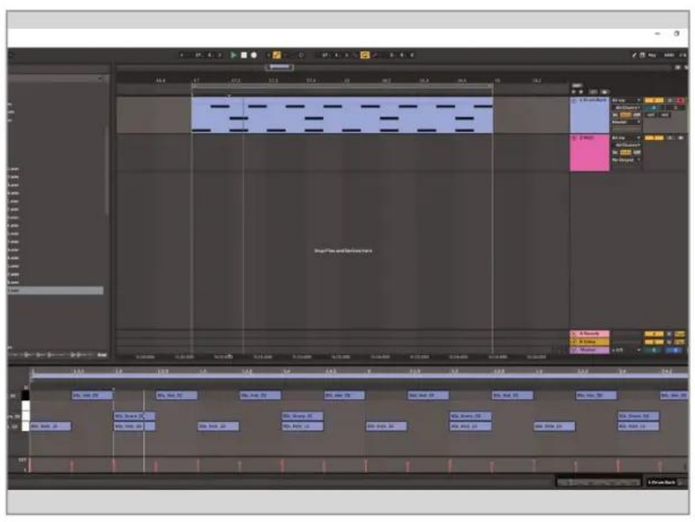
To help you get your house game on point, we've put together this unmissable guide on house production. We'll teach you how to make a funky house track using your DAW, our supplied samples and the **cm** Plugin Suite that you can find at filesilo.co.uk (at Bookazines/ Music Producer's Guide To Electronic).

>Step by step 1. Creating a house-style beat

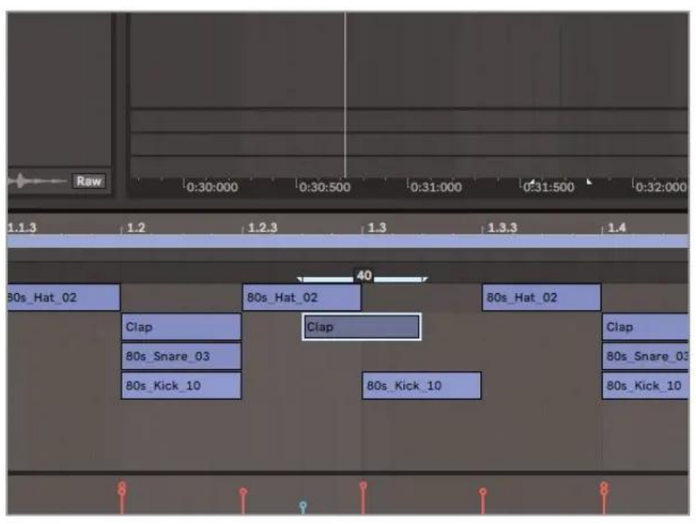
1 > The basis of any house track is the driving 4/4 drum kit. Set your DAW's BPM to 125, then add a drum rack onto a blank MIDI channel. Download the Make a House track samples folder from filesilo.co.uk; import 80s_Kick_10.wav onto a blank pad, which is a classic, New Order-sounding kick drum. Next, we'll add percussion into the mix.



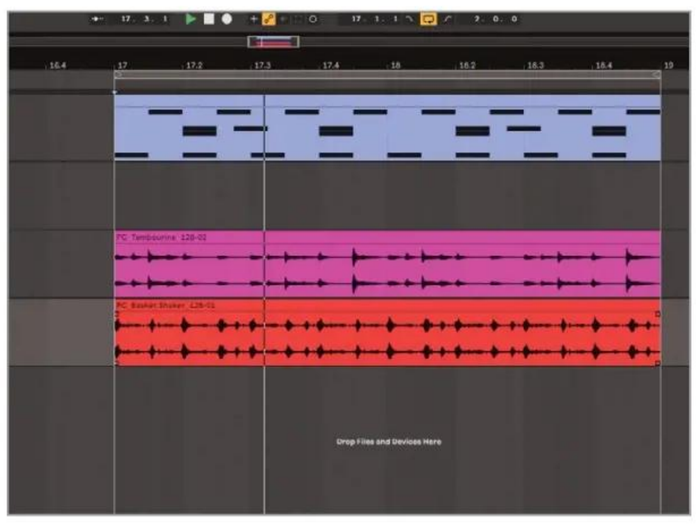
2 > From the same folder, load 80s_Hat_02.wav onto another pad. This is a splashy drum machine closed hi-hat that works on the offbeat. A snare is next, so grab 80s_Snare_03.wav and place it on a new pad. This snare sounds a bit too 80s right now, so use the sampler's ADSR envelope to tighten the decay, sustain and release, removing the Phil Collins tail.



3 > Add a two-bar MIDI clip to the channel, then program in a simple drum pattern. We'll place the kick on each beat, and snare on beats two and four. Drawing in notes to trigger the hi-hat on each offbeat adds momentum to the drums. Reduce the hi-hat and snare velocities to around 80, so they blend into the mix better. Now, let's add a clap layer.



4 > Head to the samples folder again and load Clap.wav onto another drum pad. Pitch the clap up by three semitones, so it sits more effectively with the other drum sounds. Add some notes to our MIDI sequence, so the clap is triggered on beats two and four, as well as on the last 16th note of beat two. Reduce the offbeat clap velocities to 40 to add subtlety.



5 > A few percussion loops glue our quantised drums together, while adding 'swing'. Go to the samples folder and import PC_Tambourine_128-02.wav onto a blank audio track. This tambourine loop sounds great, but is too loud; reduce it to -15dB. Add PC_BasketShaker_128-01.wav, as it suits the feel nicely. Turn down the shaker until it gels with the drums.

6 > To finish the drums, add a breakbeat sample. Import DF_BeatD_85-04.wav from the samples folder, then if you use Live, set the warping mode to Repitch to pitch up the break to the correct tempo, like using the pitch control on a turntable. Cut out the first beat of the break, and delete the rest. Duplicate what's left across the loop, then reduce it to -20dB.

RECOMMENDED LISTENING

ROBIN S
SHOW ME LOVE
A classic that transcended house into the commercial realms, this is extra notable for using Korg's since heavily-rinsed M1 organ preset.

bit.ly/rs_sml

DAFT PUNK
ONE MORE TIME
A monster hit for the Parisian pair, this has that French house sound that combines strains of disco with a looped-over hip-hop aesthetic to boot.

bit.ly/dftpnk_omt

MR FINGERS
CAN YOU FEEL IT
One of house's defining tracks, when US producer Larry Heard combined Roland drums with warm synths to create a masterpiece still revered today.

bit.ly/mrf_cyfi

CAMELPHAT & ELDERBROOK
COLA
One of house's big recent hits, *Cola* mixes typically crisp Camelphat production, with a beautiful vocal. A real earworm.

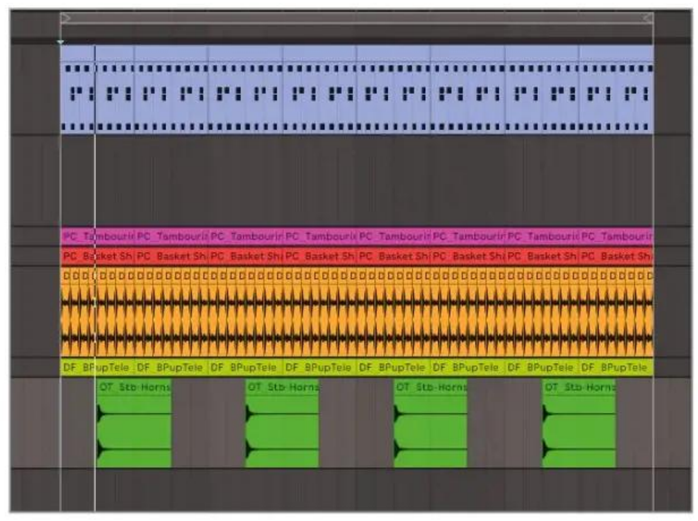
bit.ly/cpe_cola

PRO TIPS

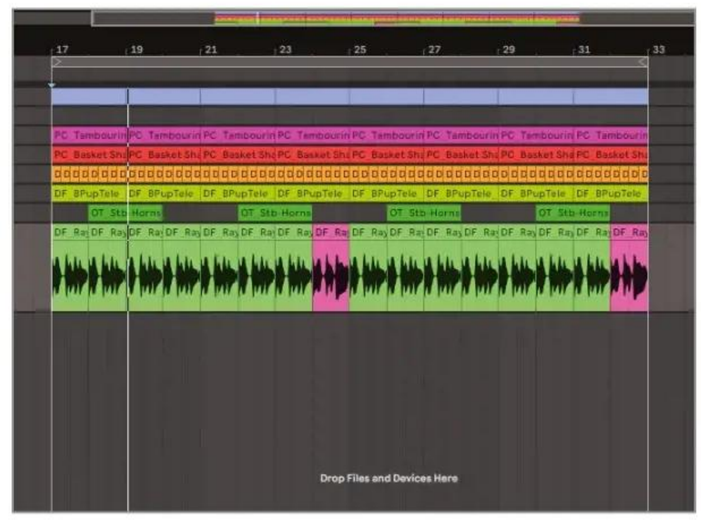
GROOVE IS IN THE HOUSE
A big part of achieving a convincing sound when producing house is making sure that your drums have a nice groove, that contrasts well with other rigidly-quantised sequenced parts you've used elsewhere in the track. A great tip for achieving this is to snip a bar or two of drums from your favourite records (old or new), before extracting the groove into a template that you can apply to your own record later on.

LOW-END BLEND
It's crucially important to achieve a solid relationship between the kick and bass. If the fundamental frequencies of the two instruments clash, this can result in ungainly distortion and masking, leading to a lack of clarity. To avoid this, make the two instruments sit apart from each other, naturally using clever sample selection and writing techniques. For example, if the basses' root note sits where the kick does, play the root notes on the offbeat.

7 > Let's build on our drum kit with sounds that work for our intro. Duplicate the two-bar drum loop into a 16-bar section. Head to the sample folder and grab a funky guitar loop to get any dancefloor grooving. Import DF_BPup_Tele_110-E.wav, and set warp mode to Complex Pro to reduce artefacts. Copy the guitar loop across the arrangement.



8 > Turn down the guitar, so it sits more cosily in the mix. Grab a horn stab from the sample folder next; import OT_Stb-Horns-E3.wav onto a new audio track. Place the stab on the second bar of the section, then duplicate it three times so there's a stab happening every four bars. Turn down the horn stab to -10dB, so the levels are kept in check.



9 > A bass guitar sample adds funk to our track. Import DF_RayMutron_120-E.wav onto a fresh audio track. Change the warp mode to Complex Pro, then split the sample into two one-bar sections. Copy the second section across to the eighth and 16th bars as a fill, before duplicating the first section to fill the gaps. Now, let's start building the arrangement.

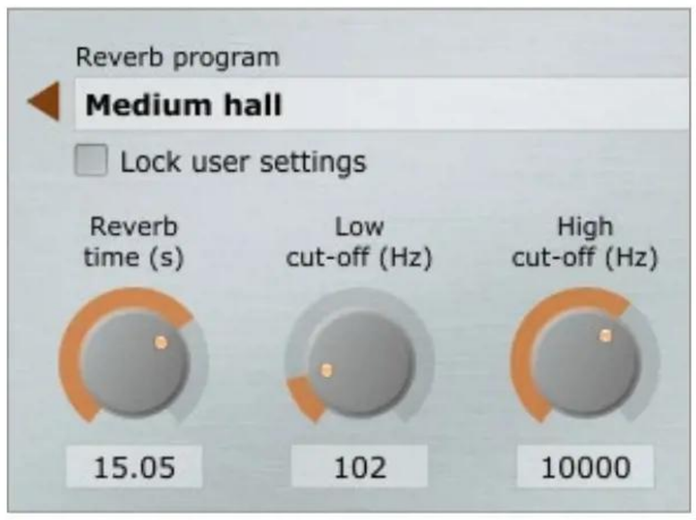
10 > Start by moving what we've made over to bar 49, so there's space before to start building the intro. Copy the drums to fill the first 48 bars, then mute the kick from the first 16-bar section. We'll also mute the shaker for the first eight bars, to embellish the arrangement further. Copy the horn stabs across the entire intro next, to start adding a musical edge.

11 > Mute our programmed kick, snare and hat groove for the last 16 bars before the drop. Copy the guitar into this section, then delete all drum and music clips from the last bar before the drop. Duplicate the bass fill into this gap, so we can build up to it using effects. Grab 70s_Synth_Rise.wav from the samples folder, and place it four bars before the drop.

12 > Some outdoor ambience adds flavour to our intro. Import GO_BirdsVarious-21.wav onto the arrange page, then duplicate it across the intro. Turn the bird noise down, so it blends in. Grab Crash F.wav from the sample pack, lower it to -6dB, then place it at the start of every 16-bar section so it defines each part, adding detail to the arrangement.

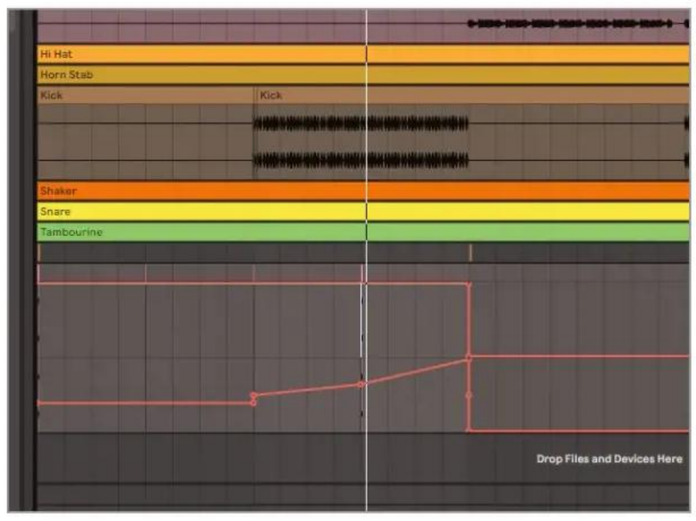
> Step by step 2. Designing some effects

1 > Let's use the **cm** plugins arsenal to create some killer effect sounds, using the parts already in our track. Start by copying one kick sample onto a new channel at the start of the intro, so we can create a reverb kick. Add Acon Digital's CM Verb on the channel.



2 > Pushing the Reverb Time up to around 15 seconds gives our kick a huge sound that carries over the intro with aplomb. Increase the Low Cut-Off to 100Hz, so the effect isn't too boomy. Copying the kick drum to the start of the breakdown helps to make that section more individual.

3 > Let's start looking at the guitar. Take the first note, and copy it onto a new audio channel placed at the intro's beginning. Duplicate it three times, so that it plays every eight bars before the breakdown. Add Subsonic Labs' WolframCM to the channel, so we can spice the stab up.



4 > Call up the CM Rise Of The Delays preset; this gives the guitar stab a cool, analogue-sounding delay tail that'll fill space in the intro. To finish, automate the Modulation 2 dial so that the delay effect gets gradually stronger during the intro, before cutting abruptly when you get to the breakdown.

> Step by step 3. Mixing your bass

1 > Turn down the Bass channel to -3dB, so that the bass sits back in the mix without getting lost. Next, we'll shape our raw bass with an amp simulator; load Audio Assault's BassAmpCM on to the channel. Turning on Deep adds extra depth to the sub frequencies.

2 > Reduce the Bass amount to 5, so that the sub frequencies don't dominate the mix. We'll reduce the wet/dry MIx to 7, so a little of the dry signal is brought back into the mix. Next, add DDMF's IIEQPro CM to the channel so we can EQ the bass.

3 > Set Band 1 to make a -3dB AnaPeak cut at 70Hz with a Q of 4, to carve extra room for the kick. To finish, draw in automation so that the EQ plugin is only active while the kick is playing, creating room without making the bass sound overly hollow.

Drum mixing

To achieve a convincing, professional sound from your own house production, it always pays to spend time on getting the drum mix sounding right, as they are the driving force behind the entire track. As house primarily features a 4/4 kick drum, making sure that the kick can be clearly heard on every single beat is of utmost importance. You might find that the snare/clap you've used masks the kick, so to avoid this make some careful EQ notches in your kick to give the snare room to breathe at around 200-600Hz.

Another great tip is to push the kick slightly up in volume from where you'd like it to sit, before placing a compressor on your drums bus. As the kick drum typically has more weight and energy than the other drum sounds, this'll drive the compressor as it grabs hold of the excessively loud kick, giving a pumping effect to the drums that often sounds amazing in this style of music.

> Step by step

4. Completing your house mixdown

1 > We'll kick proceedings off by grouping the drums, so we can process them collectively. Add DDMF's LP10 CM EQ to the drums group, then set Band 1 to an LP12 filter at 15kHz, with the Q at 0.71. This tidies up the high frequencies, creating space and reducing harshness.

2 > Set a sidechain compressor up on the shaker, using the kick as the trigger. Reduce the Attack to 0ms, so that the effect acts immediately. Adjust the Threshold to -20dB to increase the sidechain 'ducking' effect. We'll copy the compressor over to the tambourine also, adding movement to the percussion.

3 > The kick sounds a bit weedy, so let's beef it up. Add Maximal 2 CM, and push the Drive amount to 1; this makes the kick pop out the mix. Add DDMF IIEQPro CM after, and set up a -2dB high shelf cut at 1kHz to take some high mids away.

4 > Let's process the electric guitar now. Add Eareckon's CM-EQUA 87 to the channel, and set the Low Cut to 200Hz, creating space for the kick and bass. We'll dial in a -3dB cut at 1kHz using the MF band, freeing up space in the all-important mid range frequency spectrum.

5 > We'll turn our attention to the intro guitar effect. Add Sonimus SatsonCM to the channel, and set the High and Low Pass dials to 12 o'clock, this thins out the tone for effect. Push the Gain to +18 to add drive, then turn the channel volume down substantially to compensate.

6 > The FX Synth Rise is somewhat too loud, so turn it down to -6dB to improve the balance of the mix. To finish, we'll add Acustica Audio's PinkCM EQ to the master out. A 1dB boost at 10kHz adds some expensive, analogue-style sheen and detail to the final mixdown.

Effects are best

As the majority of house tracks are quite simple in their construction, you can end up with a sparse-sounding arrangement unless you overfill it with more music and drum sounds. To add detail without overegging your arrangement, try using synthesised sound effects or Foley samples.

There's a limitless supply of these sounds available online, in sample packs and on free-sample websites. However, if you want to get really creative, then why not try making your own? Synths such as Native Instruments Massive feature noise generators for making great house-style white noise bursts that can be hit with some kick-driven sidechain compression, while u-he's Diva is a great option for creating striking one-shot effects using self -oscillating analogue filters with the resonance driven to maximum.

Not free but NI's Massive will give you great noise FX

While effects are an important part of any house production, these kind of sounds work especially well with house styles that major on sampling, such as French house or funky house.

POWER TIP

> Keeping on point

With house music being a broad church when it comes to style, there's a lot of options in terms of the kind of sound you're after when producing. If you're looking to create modern-sounding tech house, for example, then it goes without saying that you should find the cleanest, most modern-sounding samples that you can as your starting point. Similarly, if you're trying to make more classic, old school house music then turning to sounds sampled from period correct drum machines, synths and even OG house records can really help with crafting an authentic sound.

RONI SIZE

In the 90s, one producer bought the *New Forms* of electronic music into the mainstream. In this classic interview, Roni Size discusses his part in drum n bass and the tech behind his early productions

> "I've done a lot of interviews over the years and so many of them have been about my life, my family, personal stuff... things I don't really like talking about in public. What gets me excited is talking about the music. Sharing the knowledge; passing it on to the next generation."

Roni Size – DJ, producer, drum 'n' bass pioneer and Mercury Prize winner, with the groundbreaking *New Forms* album – is in Bristol (where else?) preparing for possible live shows and releases. But he's always happy to take a break for an hour or two and talk about... music.

Roni Size and Reprazent's *New Forms* was the album that very much put one of the decade's major strands of electronic music on the map in the 1990s, taking it from its respected underground state to middle-class dinner parties via that Mercury Prize. Like Massive Attack did with their own slower-paced form or electronica, so Size did with drum n bass, both unleashing new sounds from their Bristol bases – and indeed basses – to the world. There is, it seems, something in the water in Bristol...

We guess it's no surprise that we're talking to you in Bristol. How much has the city influenced you and your music?

Roni Size: "Unfortunately, I don't have a direct line to God, so there was no way I could talk to him while I was in my mother's womb and say, 'Please let me be born in Bristol.' All I know is that the sound of this city and my family have made me who I am.

> "One of the teachers asked me what I wanted to do when I left school, and I said, 'I'm gonna do beatboxing.'"

"I was surrounded by music. We had the St Pauls Carnival (little brother to Notting Hill); we had blues parties; we had sound systems. I had brothers who were listening to reggae, hip-hop and soul. It was an urban cocktail before anyone had even thought of the name 'urban'.

"But what was also important was that I grew up in the age of the ZX Spectrum, the BBC Micro, the VIC-20 and the Commodore 64. There's a road in Bristol, Gloucester Road, and that's where all the music shops used to be. It was also where I came across my first computer shop. A shop... just for computers!

"The two shops were literally next door to each other, which, to my young mind, made perfect sense. Two different streams of technology, linked together. In one, you had drum machines and synthesisers; in the other, you had computers.

"Every day, after school, I used to walk down Gloucester Road, going from the music shop to the computer shop and back to the music shop. Man, I was in heaven!"

Were you a musical kid?

RS: "[Laughs] In my head, I was musical. I remember, one of the teachers asked me what I wanted to do when I left school, and I said, 'I'm gonna do beatboxing'. This teacher asked me if I was interested in music and started talking about quavers and chords, and I thought, 'Nah, man... that's not music'.

"Looking back, I wish I'd have listened and I wish I'd learned a bit more about music theory, but to me, music meant Gloucester Road and a movie called *Wild Style* [1983]. Seeing that film

"The best songs aren't complicated – they're straightforward and simple"

© Kevin Lake

Getty

made me realise what I wanted to do with my life. In the movie they had turntables, but we had tape decks and we had little computers that made these beeping sounds. That was the start of my journey.

"I didn't have the money to own any of this shit myself, so I started hanging around with kids who could afford a tape deck, an Alesis drum machine or a Commodore 64. After a while, I realised I was always the first one to turn up at that kid's house and the last one to leave. One by one, all the other kids got bored and went off to play football or ride their bikes, but I was fascinated by music technology.

"Can I make one final point about this era? Music technology, computer music, urban music – call it what you want – hadn't been done in the UK before. The horizon was as wide as you wanted it to be; the future was yours to mould in whatever way you wanted. It felt like anything was possible."

When did you finally get hold of your first bits of music making kit?

RS: "My brother jumped in way before me. He got an Atari, an S950, a Studiomaster desk... these days it seems very basic, but to us, it was an Aladdin's cave of sound. Equipment was so expensive and so rare that you felt like a king if you owned just one synthesiser. And that willingness to work with whatever was at hand was a great lesson because it made you hungry and it stretched your imagination. If I looked through my mum's record collection and found some long-forgotten soul album, I'd listen to it and pull out ten different samples that I could put to good use.

"I think my first setup was an Atari, Notator, a 707 drum machine and a Kawai K1 module. Simple, but effective. And I was so naïve that I just thought I was going to make the greatest records the world had ever heard.

"My sound was... well, I guess you'd call it digital reggae. I was listening to hip-hop and reggae and, like so many British kids at the time, I was trying to make it mine. I didn't want it to be from another country; I wanted it to be from the UK, from Bristol.

"I would argue that it was the search for our own sound that eventually led the UK to jungle. The speeded-up breaks gave it a sort of punky attitude, you had samples from hip-hop, the sub-bass from reggae and a dash of rude boy. When I found that, I felt like I was finally coming home. I had my girl, a bit of weed and, at last, I had my music."

> "You turn on any radio or TV and you will hear drum 'n' bass"

You've told the story of the first Reprazent album many times, but there's no doubting its influence on drum n bass today, and a genre that is very much still here and now...

RS: "Here we are, over 20 years later, and drum 'n' bass is bigger than it's ever been. You turn on any radio or TV and you will hear drum 'n' bass. It's part of the fabric of everyday life.

"One of the problems was that DnB started to splinter into so many different genres that people found it hard to keep up; it sort of lost its identity. But that's how music works. It comes, it goes, it grows, it brings in a new generation of fans... but as long as it's got its own unique sound and style, it will always be there.

"Where will it go from here? That's an easy question to answer. You've got kids making music today who were still in short trousers when *New Forms* came out. I hope that the likes of us and Goldie and Krust and all those guys have been a small part of their musical education, but those kids have also grown up surrounded by British urban music. Grime, garage, dubstep... that is our sound.

"Drum 'n' bass will take all those sounds and it will travel somewhere new. Occasionally, it will over-complicate itself – and I think the spread of technology has a big part to play in that – but it will always find its way back to the simple path. The best songs aren't complicated; they're straightforward and simple."

Taking the sound out live in those early days played an important part in spreading its success. How did that come about?

RS: "The reason we took it live is because we could. After we got signed to Talkin' Loud, we had the cash and clout of a major record company behind us. We had the opportunity to turn Reprazent into a proper live band that stood on stage and played their instruments. That excited me because... well, everybody wants to be in a band.

"Sure, we could have gone halfway. We could have had some backing singers, maybe a bass player and some keyboards, but we wanted the

"The horizon was as wide as you wanted it to be; the future was yours to mould in whatever way you wanted"

© Dan Medhurst

Getty

“It was a seriously steep learning curve for me”

real deal. Maybe in those situations, ignorance is bliss. We had no idea how difficult it was going to be to find the right combination of musicians, how much it would cost or even if it would work. But we’d seen The Prodigy do it live and we just jumped right in.

“Turning Reprazent into a live experience certainly helped spread the word about the album. And in turn, the album won the Mercury Prize, which was the best thing that could ever have happened to us or to drum ’n’ bass. People started to take it seriously.”

Did that success put you and the band under some pressure?

RS: “Pressure? Are you kidding? Pressure is living in a one-bedroom flat in St Pauls with no job, no money, no food to feed your kids, no prospects and no future. That’s pressure! Winning music awards isn’t pressure. It’s fun – it’s what a band is supposed to do if it’s doing its job properly.”

Although you started out with hardware and Atari, you were something of an early convert to the computer for music making.

RS: “Yeah, it must have been ’98 or ’99 – not long after we released *New Forms*. We were working in a studio somewhere and they had this huge SSL desk with a Pro Tools rig. I just looked at it and thought, ‘That is the biggest, most powerful sampler I have ever seen.’

“We were quids-in at the time, and a lot of the manufacturers were keen to offer us knock-down prices, so we suddenly found ourselves with a mammoth SSL desk and Pro Tools. We didn’t touch the MIDI side of things; all we were interested in was audio. Being able to get all our samples and our hardware onto that computer.

“Anyone who can remember the sampler days will tell you how long it took to render a bit of audio back then. You could set it going, make a cup of tea, have a smoke, make a couple of phone calls and it still wouldn’t be finished. Someone showed me how it worked on Pro Tools and, whoa, it took seconds. I could see a million doors opening up in front of me.

“Having said that, it was a seriously steep learning curve for me. Up until then, we’d used fairly simple desks. If you wanted more bass, you turned it up; if you wanted less bass, you turned it down. I looked at the SSL and I was bombarded with all these numbers. What does 40 mean? If I turn it to 40, what happens? What does 2K mean? What’s a K?

“The next ten years were my education. I’m not saying I’m ‘that guy’; I’m not one of those producers who can answer every technical question that’s thrown at him, but I know my way around the studio. I can get the job done. I understand that, alongside the ‘art’ of making music, there’s a ‘science’, too.”

We know you’re still with Pro Tools, but have you tried Ableton, Logic etc?

RS: “Tried them all and could probably turn out a track on all of them. Once you’ve got your quick keys in place, a good producer ought to be able to work on whatever he’s presented with. Otherwise, you get stuck with that old argument: I can’t do this production unless I’ve got this synth and this compressor and this platform and so on. Music is not – and never will be – about the equipment. If you’ve got something that makes a noise, you should be able to make music. I remember when we first got Pro Tools, people kept saying, ‘Man, you’re gonna have problems getting all the third-party VSTs to work with that.’ But Pro Tools had more than enough onboard stuff to keep us busy.

“I’ll admit that, yes, these days, the computer is full to the brim with plugins, VSTs, gadgets and crazy gear. But I could still give you a killer tune, even if I was back working with the Kawai and the 707. Don’t get into a situation where all your hopes and dreams are relying on what equipment you’ve got. Those hopes and dreams should only be relying on one thing: you!”

Kit list

Avid Pro Tools 11 and 12

Alesis Andromeda A6

Native Instruments Komplete Kontrol

Native Instruments Massive

Xfer Records Serum

Rob Papen synths

Togu Audio Line TAL-Sampler

Native Instruments Kontakt

iZotope Ozone 7

FabFilter Pro-Q 2

Universal Audio UAD plugins – Sonnox, Fairchild 670, Brainworx bx_bundle

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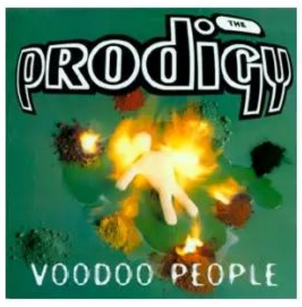


Voodoo People
The Prodigy
Year: **1994**
Original Synth:
Roland JD-800
Plugin used:
ThornCM

Voodoo People is a classic slice of 90s rave, constructed by Liam Howlett mostly from samples, including a guitar based on the riff from *Very Ape* by Nirvana. However, we're more interested in the iconic, piercing acid inspired lead synth.

This lead sound has a strong TB-303 flavour, but was actually taken from Roland's JD-800 keyboard synth, which featured on a number of classic Prodigy tracks from the era including *Poison* and *Their Law*.

To recreate the sound, we'll be using Dmitry Sches' fantastic ThornCM, which is ideal for creating the kind of distorted, resonant tone we're after, as well as packing some effects heat that'll help to embellish the sound for a more convincing overall finish.

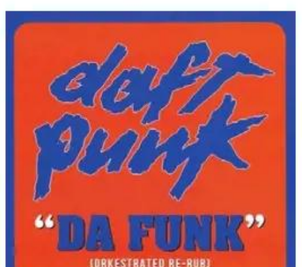
Getty

> Step by step 303 lead

1 > Dial in some distortion. Open the Effects tab in ThornCM, and enable the Distortion, with the Acid Drive preset loaded. This'll help give the texture we need. Then, set Osc 1 to a sawtooth wave, with the Sub Amount at around 50%, for the harmonic richness and depth.

2 > Use the filter to shape our sound's tone. Select the Fat LP24 filter, then push the Drive up to 100% for aggression. Pull the Cutoff down to 200Hz, then increase the Res to 70%. Now, we'll use Env 1 to modulate the filter, so it opens out. Push the Mod Amount to 40% as a start.

3 > Set Env 1's Attack and Sustain to 0%, then push up Decay to 70% to open the filter up. We'll reduce the Release to 10% to give a tighter sound, before increasing the filter's Keytrack to 60%, so that the filter changes as the riff plays up and down. ThornCM's plate Reverb adds space.



Da Funk
Daft Punk
Year: **1995**
Original Synth:
Roland SH-101
Plugins used:
DuneCM &
WaveShaperCM

Originally released in 1995 as a double A side single with *Rolling and Scratching* on the flip, *Da Funk* sold a mere 2,000 copies until it was re-released on Daft Punk's seminal 1997 album *Homework*. While the track has a very house-flavoured sound, the inspiration actually came from the (now ex) Daft Punk boys spending late nights listening to G Funk hip-hop tunes.

If you ever watched MTV 2, you might remember the iconic Spike Jones video for this track entitled *Big City Nights*, which followed the travails of a dog named Charles as he navigated NYC with a broken leg, and only a set of crutches and a boombox for company. (Hey, we remember it.)

We can make our own take on this sound, using the legendary DuneCM alongside a splash of distortion from the equally awesome WaveShaperCM.

> Step by step Growling synth riff

1 > Set the Osc Mix to 50%, to hear Oscs 1 and 2 equally. Pitch Osc 1 down an octave for thickness, then reduce DuneCM's Output Volume to 18%. Pushing the FM 2 to 20% gives the sound a more detuned, grungy feel. Set Filter type to HP12/LP12 Split to shape the sound further.

2 > Reducing the Filter Cutoff to 70%, and pushing the Res up to 40% will give a grungy sound. Increase Filter Envelope to 20%, then push the env's Attack and Decay up to 50%. Reducing the Sustain to 0%, with a short 10% Release will make the filter open and close like the original.

3 > Increasing the Amp Env's Attack to around 50% will give the sound a less machine gun, attack-heavy feel. To finish, add a splash of distortion. Call up Cableguys WaveShaperCM, with the Bottom Noise preset loaded. Reduce the mix to 20% for the thick, grungy sound we want.

Born Slippy (Nuxx Mix)
Underworld
Year: **1995**
Original Synth: **Possibly Waldorf Microwave**
Plugins used: **ThornCM, HY-FX CM**

> Originally a B-side to a markedly different instrumental track of the same name, Top UK dance act Underworld's *Born Slippy (NUXX Mix)* shot to prominence in 1995 as part of the soundtrack for cult British film *Trainspotting*, and helped the band become one of the biggest acts of that decade.

Combining lush pads, stomping techno-inspired 909 drums and a distorted, almost nonsensical one-take vocal by Underworld vocalist Karl Hyde (struggling with alcoholism at the time), *Born Slippy* was called the "heartbeat" of *Trainspotting* by director Danny Boyle and is undoubtedly one of the most iconic dance records of the 90s.

While there's no clear info about which synth made the trademark delay-soaked main riff, the Waldorf Microwave resident in Underworld's studio seems a likely culprit. Let's make our own version using ThornCM, plus processing from other plugins available to you for free at filesilo.co.uk.

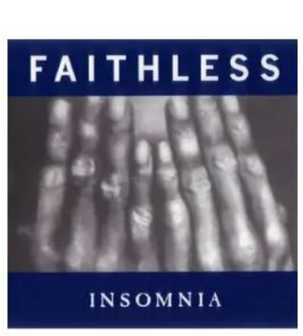
> Step by step Intro stab

1 > Start by setting both Osc 1 and 2 to a sawtooth wave, for plenty of harmonics. Next, set Osc 2's Detuning to 30 to make the sound richer still. Mix in some white noise; turn on the Noise Generator, and adjust the Volume to 50% so the noise doesn't dominate the sound entirely.

2 > Use ThornCM's filter to make the sound more recognisable. Select the CleanLP filter, and set the Cutoff and Res to their lowest. Push the Env 1 Amount to 100%, so that the filter's modulated entirely by the envelope. Increase the filter's Drive to 9dB to add extra gain.

3 > Use the amp and filter envelopes to tighten dynamics, while opening and closing the filter. Set both envs to fast Attack, with Decay at 50% and Sustain at 40%. Set the Amp Env's Release to 50%, with the Filter Env's at 60%, for a resonant tail as the filter is modulated.

4 > A big part of the track is the delay between each note, so enable ThornCM's Delay module, then set the Delay Time for both left and right to 1/8th dotted notes. Pushing the Mix up to 50% gives us what we want. Then add HY-FX CM onto the synth channel, and select Chorus.



Insomnia
Faithless
Year: **1995**
Original Synth: **Possibly Roland JP-8000**
Plugin used: **Thorn CM**

> First released in 1995, *Insomnia* became an anthem for a generation of late night clubbers who, as with the song's lyrics, just could get no sleep. The track, produced by Rollo – who would later produce sister Dido's mega hit albums – and Sister Bliss, with vocals from rapper Maxi Jazz, hit No 3 in the UK charts in 1996, and very much became one of the breakout dance tunes of the decade.

As with many dance tracks in this style, *Insomnia* made heavy use of the contemporary synths of the time. Exact details of which synth was used to make the iconic plucked riff aren't available, but it's likely that the Roland JP-8000 was used – indeed, many subsequent digital synths featured an *Insomnia* preset. For our spin on this plucked riff, we'll call on ThornCM to do the goods. Let's get riffing....

> Step by step Plucked off

1 > Turn on Osc 2, then set both oscs to a sawtooth. We'll set Osc 2's Detuning to 40 to add thickness to the sound, then turn up Osc 1's Sub Osc to 50% to add extra depth. Next, turn on the Noise Generator, and reduce Volume to around 40% to mix some crunchy noise into our sound.

2 > Using an env to modulate the filter will give our sound the shape it needs. Set the filter to Dirty LP, with the Cutoff and Res at their lowest. Push the Env 1 dial to 100%, so that the env controls the Filter Cutoff. We'll reduce the Env 1 Attack, Sustain and Release to 0, with the Decay at 40%.

3 > Increasing the Amp Env Decay to 65%, with Sustain down to 20% and Release at 0%, gives our sound a staccato feel, while 4dB of Drive to the filter increases the volume, while beefing the tone. Turn on ThornCM's delay and reverb effects, setting the Mix levels to 10%.

TECHNO

> Originating from the melding of synth-driven pop music from the likes of Giorgio Moroder and Kraftwerk alongside American music styles like house, funk and soul, techno has transcended its Detroit roots to become one of the world's most enduring and leading dance music styles, with artists such as Carl Cox, Adam Beyer and Jeff Mills in constant demand for both their productions and live sets.

Characterised by a tempo of between 120-150bpm, a palette of sounds heavily influenced by now-revered 1980s Roland kit like the TB-303 bassline and TR-808/909 drum machines, as well as a deliberately electronic, dystopian sound, techno has influenced many other music styles to varying degrees, including the UK rave scene which took inspiration (as well as a stab or two!) from the Belgian techno records that were being made during the late 1980s and early 90s.

As early techno tracks were laid down using rudimentary equipment like inexpensive mixing consoles and four-track tape recorders, the genre traditionally has a crunchy feel that's great fun to recreate in 2021. While techno seems very simple in construction, it can be harder to make than you think. However, we have a superb guide on how to make your own warehouse-shaking techno track using just your DAW, samples and the **cm** Plugin Suite that you can find over at filesilo.co.uk (Bookazines/Music Producer's Guide To Electronic). There are also videos, tutorial files and audio examples to help you follow along with ease.

>Step by step 1. Techno beatmaking

1 > We'll start by building a drum kit; set your DAW BPM to 128. From filesilo.co.uk, get the techno samples/MIDI files folder and load Kick_15.wav into a blank drum rack. This is a synthetic-sounding kick that works perfectly in a techno track. Draw MIDI notes to trigger the kick on each beat. Next, we make a rumbling, warehouse techno reverb from our kick.

2 > Add Cableguys' WaveShaperCM to a fresh return track. Set a -6dB send from the kick drum to the return, then select the 2-BIt preset in WaveShaper. Hear the kick crunching, in a gabba-esque tone. Load Acon Digital's CM Verb after our distortion. Use the Medium Chamber preset, then turn off the dry signal to leave just reverb-soaked distortion.

3 > We'll turn the reverb Send down to -9dB, so it blends into the mix. Now, let's add perc into the mix, courtesy of Audiorealism ADM CM's great emulated TR-606 drum kit. Load ADM CM to a fresh channel, then switch Sync mode to Host, so ADM CM's playback is triggered by our DAW. Let's use the onboard sequencer to create an open hi-hat pattern.

4 > Hit the Pattern Write/Clear button, and let's program our own pattern. Select the OH (open hat) instrument, then dial in an open hi-hat on each offbeat. Add a new MIDI clip to the channel, then draw in a one-bar note to trigger our pattern. We'll reduce the open hat's Decay to 100ms, for a tighter initial sound that we can open out with automation later on.

5 > Let's create a longer arrangement. Duplicate the drums over 16 bars, so we can get non-perc elements in. From the samples folder, import Delayed Radio Loop 02.wav onto a fresh audio track; this is a vocal snip that's very techno. Reduce the channel's volume to -15dB, then duplicate the audio across the entire 16-bar section.

6 > Time to add another sample for a more dystopian sound. Add TV_Talking_(100bpm).wav at the end of each eight bar section. Reduce the channel to -6dB to retain balance, then load Subsonic Labs' Wolfram CM. We'll fire up the CM Beer In My Farfisa preset, adding a sustained delay tail to our static sample and making it feel part of the track.

RECOMMENDED LISTENING

PHUTURE
ACID TRACKS

One of techno's blueprint tracks, this has the signature sounds of modern acid techno, and wouldn't sound out of place as a fresh vinyl release today.

bit.ly/ph_at

JOEY BELTRAM
ENERGY FLASH

In a genre driven by technological development, this 1990 cut still sounds fresh in 2020. One of many cult tunes from R&S Records.

bit.ly/jb_ef

JEFF MILLS
THE BELLS

All the ingredients of a techno classic, including the crunchy drums Jeff Mills is known for, alongside the Roland hi-hats that adorn most techno tunes.

bit.ly/jm_tb

APHEX TWIN
DIDGERIDOO

Aphex Twin's trademark running, breakbeat-like drums, alongside a manipulated didgeridoo sample that's equal parts Australian outback and dystopian techno.

bit.ly/at_ddgrd

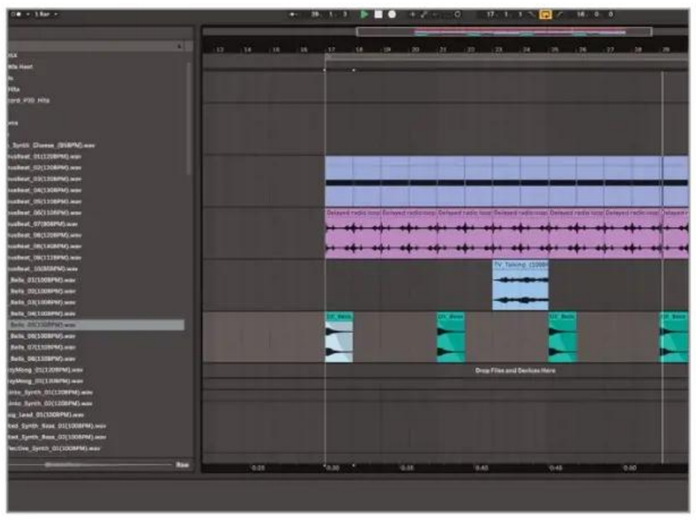
PRO TIPS

SIDECHAIN GAIN

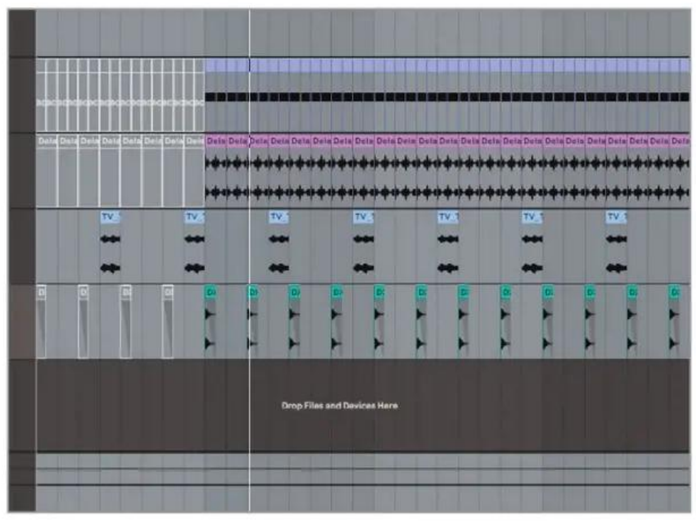
A superb way of adding unique flavour to your techno productions is to use a kick-triggered sidechain compressor on a constant field recording of ambience, but reverse the compressor's curve so that the ambience pumps along with the kick, rather than around it. Either simply reverse your kick drum on a silent trigger channel, or use an infinitely configurable modulation plugin such as Xfer Records' LFOTool.

ONE STEP BEYOND

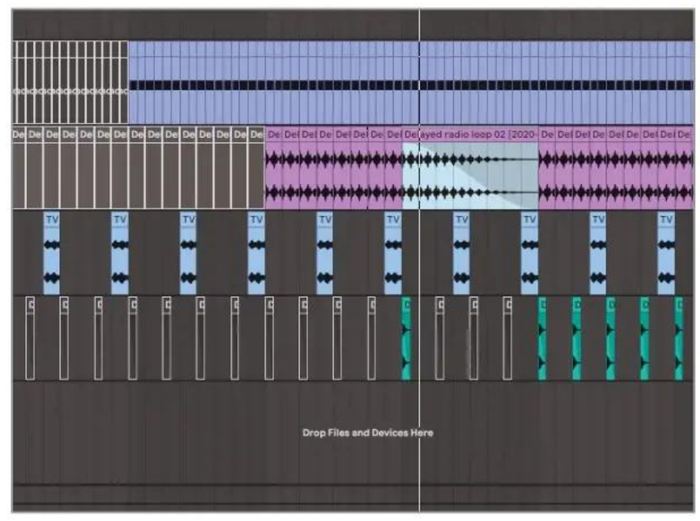
If you're making a stereotypical techno beat using TR-909 samples, try triggering them using a MIDI step sequencer, instead of placing them directly on the arrange page. As this was how techno was produced originally, you'll achieve a more authentic sound, particularly if you use your sequencer's on-board swing control to add groove. HY-Plugins do a great MIDI step sequencer called HY-MPS2 that comes in either free, or paid-for flavours.



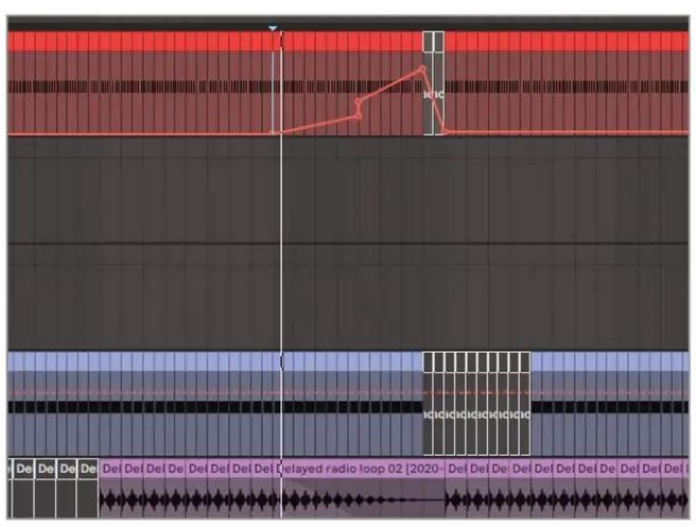
7 > Another element fleshes things out. Grab DX_Bells_05(100bpm).wav from the sample folder, and place it on a new audio channel. Shorten the clip to one bar, then apply an aggressive fade out. Copy the audio snip, so it plays every four bars. Reduce the channel to -7dB, so our mix balance is preserved. Next, we start building our full arrangement.



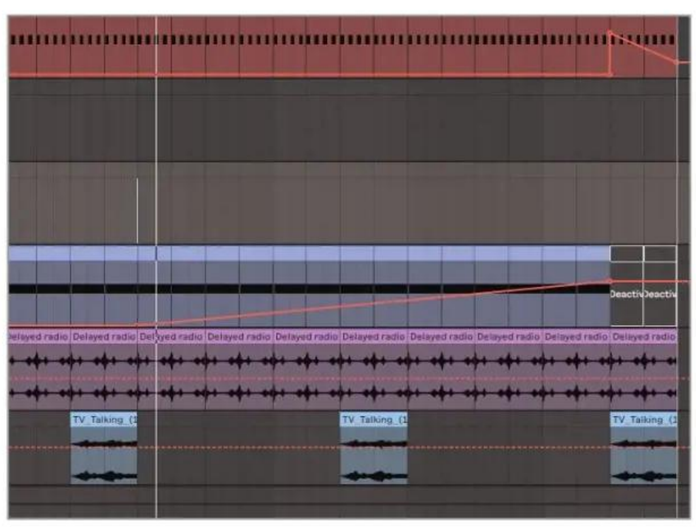
8 > Unlike other styles of music that are more focused on building to a drop, techno is arranged in a more progressive manner, with emphasis placed on making the sounds in the arrangement evolve. Let's build our arrangement. Duplicate the parts we've added already to create a 64-bar section in total. Mute the open hat, bells and vocal snip for the first 16 bars.



9 > We'll mute the vocal snip for the second 16 bars, with the bells muted for 32 bars. Duplicate the final 16-bar section twice, for use as the basis for the drop. Let's strip back the previous section now. Mute all the bells except the first one, then consolidate the vocal snips into one. Apply a fade to the vocal, so it disappears over 16 bars.



10 > Mute the kick and open hat for the last two bars before the drop, so the sound effect we added earlier is emphasised. We now use Vengeance's VPS Philta CM to filter the kick. Add it to the channel, then draw in automation of the high-pass filter so the kick sounds increasingly hollow during this section. Next, mute the open hat from the first eight bars of the drop.



11 > Make the arrangement evolve by automating the decay of our open hat. Draw in automation, so the hat becomes more intense as the intro develops, before snapping back to a tight sound on the drop. We'll ramp it up for the second 16 bars of drop, before muting the hat for the last two bars. Automating the kick's filter for the last two bars creates a fill.

12 > Automate the kick's reverb return volume leading to the drop, so it increases to 0dB before snapping back to its usual -9dB after; this makes the reverb swell into a cool effect. To finish, add a crash cymbal to the start of each 16-bar section to mark them out. Head for the sample folder, and grab 80s_Cymbal_04.wav. Reduce the channel to -18dB.

> Step by step 2. Creating a techno-style 'stab'

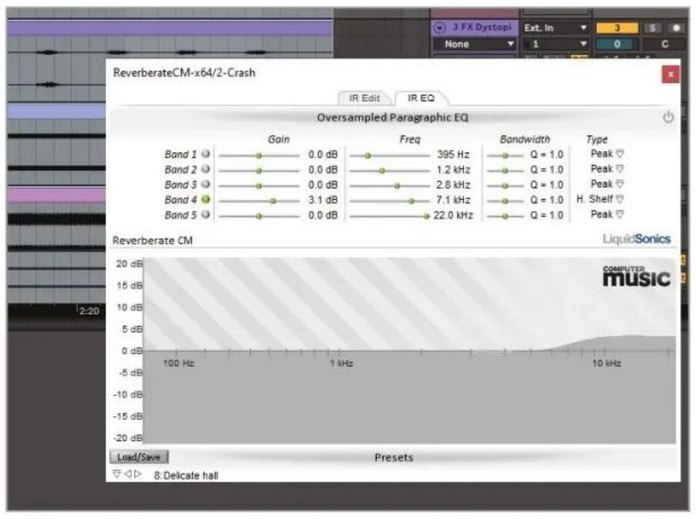
1 > Let's create a cool techno stab using Dmitry Sches' superb ThornCM. Load it on a fresh channel, then import Stab.mid (from the techno samples/MIDI files folder at filesilo.co.uk) to trigger the synth. Open ThornCM, and set Oscillator 1 to a square wave; this has lots of harmonics and is an ideal starting point for a techno stab.

2 > We'll use Oscillator 2 to modulate the frequency of Oscillator 1. Turn on Oscillator 2, and turn the Volume to 0%. Set Oscillator 1's FX type to FM, and push the amount to 50%; you'll hear the stab's tone change. Tune Oscillator 1 down by an octave to add character.

3 > Modulating the filter shapes our sound. Set the Filter Mode to Dirty LP, with the Env 1 dial at -100%, so that Envelope 1 controls the filter cutoff. Adjust Envelope 1's Attack to 40%, with the other three sliders all at 50%; you'll hear the stab become less open-sounding.

4 > Let's shape the sound more with the Harmonic Filter. Choose the Bass Contour 1 preset, and dial the Shape in at 60%; you'll hear the filter remove a little weight from our stab. To finish, push the Filter Drive to 3dB or so; a little drive adds volume and thickness.

> Step by step 3. Adding effects



1 > We make our techno track sound a little bit more complex by adding in some effects processing. Start by loading PSP's cmDelay onto the Bells channel. Turn the Sync on, and set the Delay time to ¼ notes. Automate the Feedback aggressively from bar 49 until 63, so that the bells swell in volume.

2 > The delay tail gets overly loud during the break, so automate cmDelay's Wet level so it decreases by around 6dB as the breakdown unfolds. Let's now turn our attention to the crash cymbal, which ends abruptly right now. Add Liquidsonics' ReverberateCM onto the channel, and pick the Delicate Hall preset.

3 > The reverb preset that we've selected has a long tail, and disguises the short crash brilliantly. However, it sounds a little dull in the mix, so open the IR EQ tab, turn on Band 4 and set it to a High Shelf. Boosting the band to 3dB adds high frequency sparkle.

Rumbling reverb

Reverb is an essential part of the techno recipe, and can really set your track apart from others in the genre. Often used to create a sense of space in a more minimal production, or to add that trademark rumbling bass tone that fills out the low frequencies around the kick, well used reverb simply sounds great in a typical, echoey warehouse techno rave.

A great tip when using reverb in your own production is to be very aware of mono compatibility. Generally, reverb is used to mimic the acoustic properties of a space, and phase cancels to a degree when collapsed into mono. Meanwhile, techno is primarily intended to be heard in a club setting, on some kind of chunky mono PA system.

These two conflicting things can be hard to balance well, so try using mono reverb for at least some parts if you want the reverb sound to translate faithfully to the rave, particularly if it's a rumbling reverb applied to a kick drum.

> Step by step

4. Mixing your techno masterpiece

1 > First, we'll use your DAW's sidechain compressor to duck the kick reverb when the dry kick hits, increasing low frequency clarity. Add the compressor, setting the kick as the sidechain input. Decrease the Attack to its fastest setting, and adjust the Threshold until you hear the ducking effect kick in.

2 > The bells stick out of the mix slightly, so turn them down to -3dB. We'll EQ them too, so they gel with the mix nicely. Add Eareckon's CM-EQUA 87 to the channel, switching the Cut filter to Hi Cut. Set the frequency to 5.5kHz, so the highs are tamed.

3 > We'll carve out some breathing space in the low mid frequencies now. Set the LF band to a shelf, with the Frequency at 450Hz. Dialling in a -6dB cut gives added clarity to the low mid area, without bluntly removing the bell sound's richness like a harsh filter can.

4 > Now, we'll add crunch to the mix for a more authentically techno sound. Start by placing Rob Papen's beastly RP Distort CM on a return track. Select the 909 Mackie Ch Dist preset; this emulates the crunch of a classic Mackie mixing board like those used back in the day.

5 > Set up some -18dB sends from the kick, crash and open hat to our distortion return. The distorted effect adds bite, drive and character, but overpowers the mix, so turn the distortion return channel down to -24dB. Next, we'll work on the synth stab we created earlier.

6 > Add Surreal Machines' Microfuse onto the channel, and select the Hybrid Bouncing Hall preset. This adds a spacious feel to the stab. Reducing the Size to 20% makes the effect gel with the track better. To finish, reduce the Regen to 30% so the effect doesn't overly feed back on itself.

Automation nation

The very best way to turn your own arrangements from a generic soup of samples and synths into something with life, character and flair is to use automation to evolve the sound of your track as it progresses. Automation is used in pretty much every professional music production you hear in numerous ways, ranging from the age old trick of boosting the master fader slightly for a song's final chorus, all the way through to the evolving delays and reverb used in dub mixing.

Originally, automation of mix parameters and effects was done live by the mix engineer as the song's final mix was dubbed to master tape, adding a level of pressure to get it right the first time. Now, we can program automation into our DAW, allowing us the time and space to get it sounding the way we want. If you've been looking to get a more human feel from your automation, then why not think about recording it in using a suitably equipped MIDI controller?

Using a controller like the Akai LPD8 can help add a human touch

POWER TIP

> Bassy toms

Roland drum machine sounds from the likes of the TR-808 and 909 are a staple in most house and techno tracks, as the original hardware is from the same era. So, a great tip if you're looking to create a cool bass for your techno track that's slightly different to others, is to grab an 808 or 909 tom, and pitch it down to the bass register using a sampler. As the toms are synthesised using similar circuitry to a kick drum, they carry plenty of weight when pitched down.

> make electronic music now / trance

TRANCE

Come with us to a hypnotic, trippy dimension and produce a track in one of the 90s' best genres...

> Despite having been around for at least three decades, trance remains a bafflingly divisive and controversial genre. To some, it's a hypnotic, euphoric style of music with deep, spiritual roots. To others, it's a naff, cliché-ridden sound which repeats the same tired old formulas ad nauseam (or, as Dave Clarke memorably put it, "watered-down techno").

We're nothing if not open-minded. While there's no doubt that the distinctive stylistic tropes of trance make it easy for producers to fall into the trap of cliché, it can be joyously vibrant and exciting when done well.

Since emerging as a distinct genre in the early 90s, trance has waxed and waned in popularity, spawned countless subgenres – which we'll get into – and provoked some strong reactions of love and hate.

To the hardcore few, trance never went away, but in the last few years, the style has gone through something of a critical reappraisal, with a new wave of producers introducing trance elements to their sound and exploring the genre's potential.

How are we defining it? As a genre it's quite varied, but easily spotted by its key characteristics. Broadly speaking, it's a four-to-the-floor offshoot of techno, typically between 130 and 150bpm. More importantly, though, there's almost always a certain epic quality to the sound, based around repetitive melodies, minor-key chord progressions, dramatic build-ups and breakdowns.

We'll show you where it came from, how it's done and how you can go full-on trance – or just introduce a few subtle elements to include in your own productions and genres.

10 Trance mainstays

There are a range of elements that might be best described as ‘trance tropes’. These are not essential to all trance tracks, but have come to be known as signifiers of the genre. Here are the main ones...

01 SUPERSAW SYNTHS

At this point, the supersaw synth is probably the single most recognisable sound of trance, dominating everything from psytrance to EDM. The Roland JP-8000’s supersaw sound is the granddaddy of them all, essentially an attempt to replicate the fuzzy, thick sound of seven sawtooth oscillators detuned against each other. The sound quickly became a staple of dance music generally, but trance producers adopted it as a mainstay, using it for pads, leads and even bass. The original point of the supersaw was to achieve something that would be difficult on a true analogue synth (you’d need dozens of oscillators to play a truly analogue supersaw pad). Nowadays, in software, that’s not a problem; most synths can do multi-oscillator supersaw-style sounds, whether via a dedicated supersaw oscillator or an oscillator detune/unison option. The closest thing to the 90s virtual analogue original comes in u-he’s Diva, courtesy of the digital oscillator, modelled on the original Roland sound.

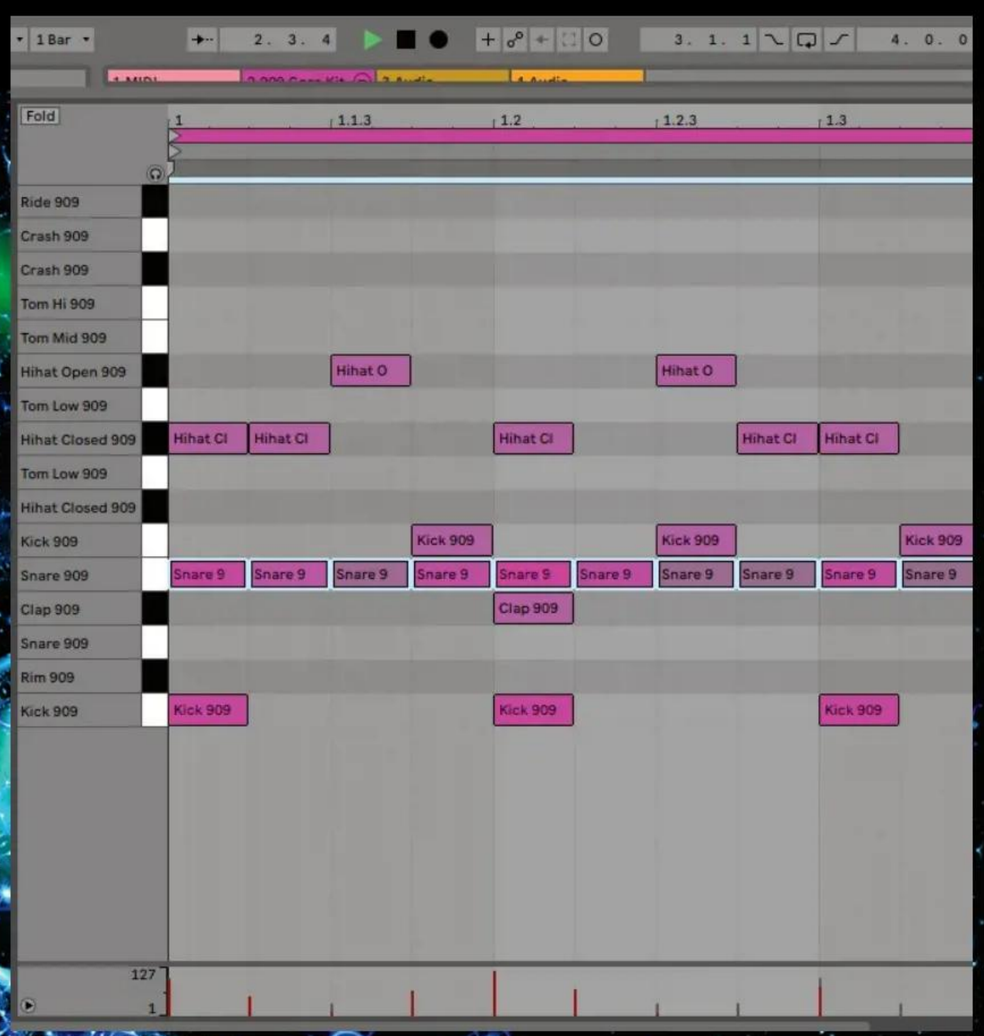
u-he’s Diva does the supersaw better than most

02 BUILD-UP/ BREAKDOWN

Speaking of the arrangement, trance is all about the slow build and sudden breakdown. It’s a common formula across plenty of other genres, but trance does it better than anyone. Some subgenres emphasise the drop, where the reintroduction of a heavy kick drum and bassline is the focal point, but in other styles it’s almost the exact opposite, with the hands-in-the-air breakdown being the key moment, and the reintroduction of other elements being downplayed by comparison. Ebb and flow, tension and release: trance celebrates the contrast.

03 PADS AND CHORDS

Minor key progressions and synth pads are the bedrock of trance’s epic sound. Although plenty of trance tracks could be described as two-chord wonders, there’s also room to get a lot more complex than you typically might in house or techno, with constantly changing chords, contrasting verse and chorus sections. But you shouldn’t be scared to experiment, even if you’re not extremely clued up on music theory. Anything goes.



04 TRANCE DRUM RUDIMENTS

The 909 is a staple of trance, thanks to the genre’s late 80s/early 90s roots. A simple four-to-the-floor kick and offbeat hats will get you started, but long snare rolls are also common. 16th- or 32nd-note rolls are good but will sound robotic without some variation in velocity and/or pitch, so try building up or emphasising beats to avoid a machine gun effect. Once you’ve cracked the technique with a 909 snare, experiment with layered acoustic hits, other drum machines and even white noise.

05 ARPS

One of the best ways to add interest and movement to those epic chord progressions is by playing them using arpeggios. These can be used to provide relief from the thicker, slower pads or sit on top of them, filling in other areas of the frequency range. Of course, lots of soft and hard synths have built-in arpeggiators, but you can use MIDI effects in most DAWs to create arpeggios without having to play or program them manually.

06 OFFBEAT BASS

With the relentless four-to-the-floor kick drum pounding away throughout most trance tracks, it's easy for the bottom end of the mix to get overloaded when bass is added. One of the common solutions in trance is to play the bass notes in the offbeats, ie every 'and' of a "one-and-two-and-three-and-four-and..." count, with the kicks sitting on the 'one', 'two', 'three', 'four'. By placing the bass notes in between the kicks like this, they naturally find their own space in the mix without having to EQ heavily or use sidechain compression to duck the bass.

07 TRIPLET BASS

A staple of psytrance is the triplet bass, named after the simple musical theory that defines its rhythm: three notes (triplets) per beat (or sometimes two beats). It sounds more confusing on paper than it does to the ear; the interaction of the straight 4/4 kick drums and off-kilter bass notes provides an almost woozy, lilting feel to the rhythm, almost as if the track is slow and fast at the same time, regardless of tempo. There are people who think the trick has become a bit tired and overdone, but it's so effective that it doesn't seem to be dying out just yet.

08 DELAYS

The use of effects varies from one trance subgenre to another, with some going in for big and bold reverb (even on kick drums), weirdo filters and modulation. What you'll tend to find, even in the sparser styles, is liberal use of delays on simple melodies and arps in particular, adding complexity and rhythmic interest to otherwise quite basic elements. Spot effects on specific sounds can also be hugely effective, whether to emphasise changes in the arrangement or smooth transitions between one section and the next. We prefer delays with a bit of character to the sound, like Valhalla DSP's ValhallaDelay.

Try pitchshifting fed back into itself for wild vocal FX

09 GATED SOUNDS

Since the early days of trance, one of the most common tricks to liven up pads, leads and samples has been to feed them through a tempo-synced gate. There are quite a few different ways to achieve the effect. Some synth instruments contain a built-in gate, but you can apply similar principles to any other sound. The manual approach is to set up an aux with a noise gate on it, then use a muted channel as a trigger to feed into the gate's sidechain. It's much easier to use an effect sequencer such as Sugar Bytes Effectrix, which allows you to program interesting tempo-synced patterns with gates (and much more). Alternatively, for a basic but extremely quick version of the sound, you can use a simple tremolo plugin or something like Cableguys' VolumeShaper.

10 MIXDOWN

Early trance was largely a rough-and-ready affair, following the house and techno of the era with ramshackle arrangements and slightly clunky mixing by modern standards. Over the years, though, things have generally got much cleaner, louder and more polished thanks, in part, to the technology used, but perhaps more importantly down to an improvement in production techniques. More commercial trance styles generally follow the modern trends for frequency separation and heavy compression, but there's still a lot to be said for a slightly more retro, lo-fi approach if that's what you prefer. The sound of the mix can define the track, so don't be afraid to experiment until you find the approach that works.

Classic trance tracks

From the earliest trance through to modern takes on the sound, we trace the evolution of the genre through ten classic tracks

THE AGE OF LOVE – *THE AGE OF LOVE (JAM & SPOON MIX)*, 1990

A strong contender for the title of first proper trance track. A lot of the key elements here had been used before, but Jam & Spoon's remix combined many of the components which we now take to be staples of trance: lush pads, relentless melodies, gating effects, pounding kick drums... an instant classic.

PAUL VAN DYK – *FOR AN ANGEL*, 1994

Undoubtedly a high point of trance's mid-90s heyday, from one of the masters of the genre. Simplistic piano riffs and pulsing synths are underscored by propulsive bass and drums, somehow ending up simultaneously blissed-out and energising.

JOSH WINK – *HIGHER STATE OF CONSCIOUSNESS*, 1995

Is this techno or is this actually acid house? Maybe neither. *Higher State* can stake a claim to various genres, but it's certainly indebted to the loopy repetition of trance, showing that acid can be trancey too. There's a subtle dividing line between the styles (and many people would probably file anything with a 303-style acid line under house or techno) but there are huge similarities in terms of structure, builds and breakdowns.

ATB – *9PM (TILL I COME)*, 1999

Late 90s commercial trance is where things start to get a bit dubious. The sound was huge across Europe for a few years, but things soon turned stale. To some, the slightly childish melodic hooks and vocal samples of tracks like *9PM (Till I Come)* are the turning point. It has a certain charm, but there's no doubt things were starting to get tired around this era.

SASHA – *XPANDER*, 1999

The perfect antidote to cheesy commercial trance came in the form of *Xpander*, which signalled something of a dividing line between progressive trance and the progressive house sound with which Sasha became associated with. Eleven minutes of rolling, wistful magic.

INFECTED MUSHROOM – *BUST A MOVE*, 2000

Weird and wonderful stuff from the Israeli trance veterans. Acoustic percussion and guitars meld with synths and slamming kicks, proving that trance doesn't just need to be about the obvious sounds. If anything, the genre is always at its best when breaking away from the rules and conventions.

NATHAN FAKE – *THE SKY WAS PINK (JAMES HOLDEN REMIX)*, 2004

On a similar note, Fake and Holden's left-field trance classic showed there was still huge creative potential in a genre that some had already written off. Oddball melodies. Sidechained noise. Wonky beats. Glorious.

MAGNETIC MAN – *I NEED AIR*, 2010

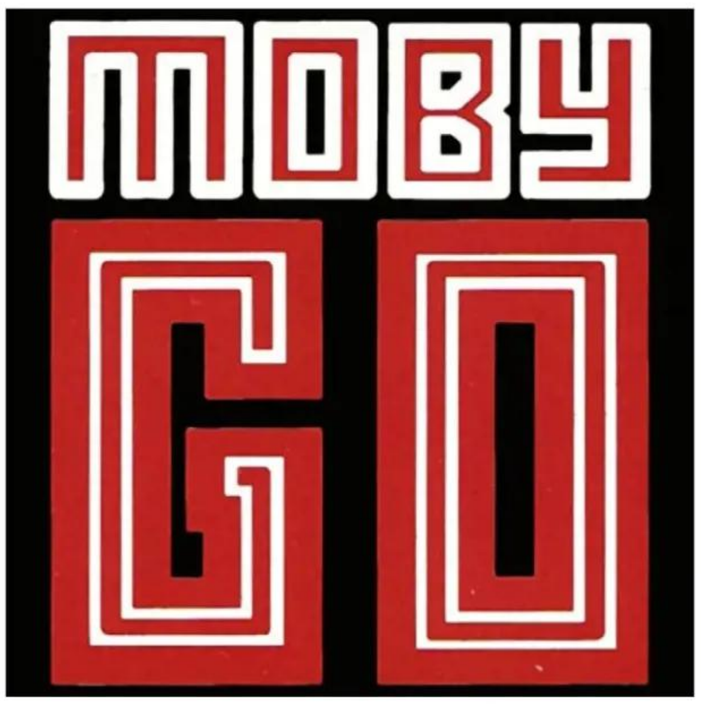
OK, it's certainly not straightforward trance as we know it, but there's no denying that on tracks like *I Need Air* and *Anthemic* the dubstep supergroup brought trancey stabs, arps and sawtooth synths to their bass-heavy sound, proving the huge crossover potential. It's hard to think of any genre that couldn't be fused with some of the broader ideas of trance, from repetition and structural tricks through to specific sounds.

LORENZO SENNI – *THE SHAPE OF TRANCE TO COME*, 2017

Senni's 'deconstructed' trance experiments explore the extreme, minimalist limits of trance's potential. On *The Shape Of Trance To Come* he fuses hardcore punk attitudes with classic JP-8000 supersaw synths. One of the artier takes on trance, no doubt, but deeply engaging and uniquely comforting in its own way.

BICEP – *GLUE*, 2017

The duo are dance music scholars, open to a bit of everything. On tracks like *Glue* and *Orca*, they flirt heavily with trance, bringing the classic sounds to new generations. With the resurgence of more mainstream interest in trance, house and techno audiences are once again receptive to what might have been written off as cheesy a few years ago.



MOBY – *GO (WOODTICK MIX)*, 1991

You can argue until you're blue in the face about what constituted trance back in '91 but, whatever, Moby's *Go* brought the genre – or a version of it – to the mainstream. Indeed, with just a couple of sampled vocals and a chord progression lifted from *Twin Peaks*, it arguably shaped that entire decade of repetitive beats.

DRUM & BASS

> DnB is a fast-paced style of music that has its roots in the 1990s London jungle scene. Early jungle records combined booming, reggae-inspired bass with heavily edited, pitched up funk breakbeats and samples taken from music styles such as hip-hop, ragga, jazz and techno. As jungle passed its peak in popularity, a new take on the sound emerged, which was known as drum & bass.

While the two styles of music are closely related in terms of BPM, structure and production style, DnB in comparison is typically more refined, both in terms of drum programming and overall production values. Great importance is placed on sound design, clever sampling tricks and making the low frequencies weighty, without compromising on loudness or brightness.

Part of the undoubted appeal of DnB is the wide variety of styles and influences that make up the genre, ranging from the uplifting liquid sounds of producers such as Calibre and Brookes Brothers through to hard as nails, jump-up smashers from the likes of Hazard or DJ Guv. With such a wide variety of colours in the DnB pallette, we couldn't think of a better idea than showing you how to make a DnB tune of your own. Over the next few pages we'll show you how to create a track in any DAW using the legendary **cm** Plugin Suite and samples that you can find at filesilo.co.uk (at Bookazines/Music Producer's Guide To Electronic). Time to up the tempo and get producing...

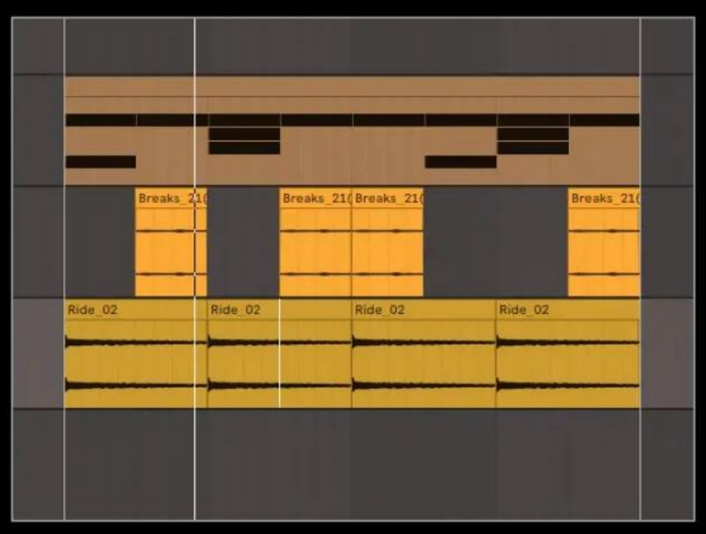
>Step by step

1. Creating a DnB-style track – a rapid-fire guide

1 > Let's make a basic drum kit that we can build our track over. In a blank 174bpm project, add Brunsandspork's Grooove CM to a fresh MIDI channel; this is a drum pad sampler that's ideal for one-shots. Go to the Drum n Bass Folder at filesilo.co.uk, and import Kick_25.wav. To create room for our sub bass later on, pitch up the kick by five semitones.

2 > A finger click is the ideal basis for a light, layered snare; import Klick.wav into Grooove CM. We'll combine it with a real snare layer to give the finished snare power. Add Snare_10.wav in a blank lane. Finally, grab a live-sounding closed hat (we've used Closed_Hat_06.wav) and load it into our sampler. Now, create a drum pattern with these one-shots.

3 > Add a new MIDI clip to the channel, then draw in a basic 2-step drum pattern with the kick on beat 1 and offbeat of beat 3, snare/click on beats 2 and 4 and the hi-hat on 1/16th notes. To stop our drums running into the red, turn down Grooove CM's channel volume to around -6dB. Now we've got a basic groove running, we'll add a sampled breakbeat.



4 > Load Breaks_21(100bpm).wav onto an audio channel. We'll cut the shuffles from the break, and put them between the kick and snare hits. Adding the breakbeat shuffles gives our drums momentum; add splash to the high frequencies with a ride cymbal. Import Ride_02.wav, and place it on every beat. The ride's way too loud, so turn the channel down to -18dB.

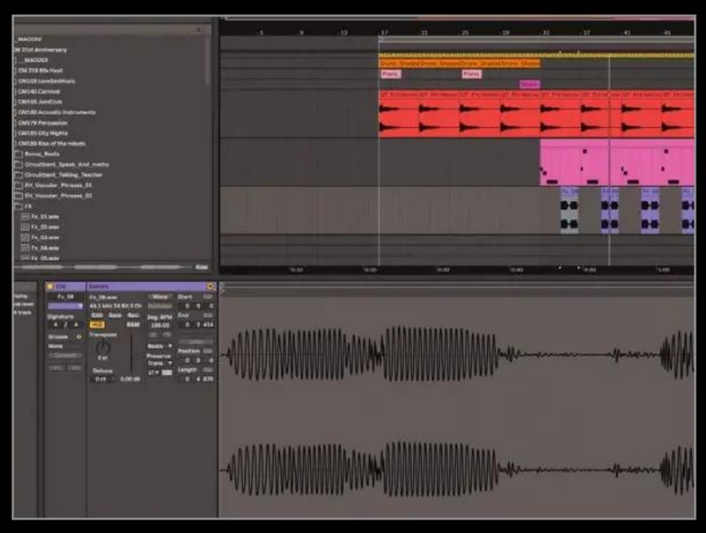
5 > Add a fade to the start of each ride hit, so the initial transient doesn't clash with the kick, snare or hi-hat. Duplicate the drums across over 16 bars. Now, put some musical elements in. A drone sets the scene nicely, so import Drunk_Shadows_(100bpm).wav from the samples folder. Reduce the channel's volume to -9dB, so it doesn't overpower the drums.

6 > Grab Piano_Delay_01_(120BPM).wav from the Drum n Bass folder, and place it on beat 2 of bar 1. This is a dystopian piano stab that goes with our drone. Copy the piano to the second eight bars, then turn the channel down to -15dB to keep the mix tidy. Import Statik_Rev_(120bpm).wav, and put it two bars before the loop's end, with the volume at -15dB.

>Step by step

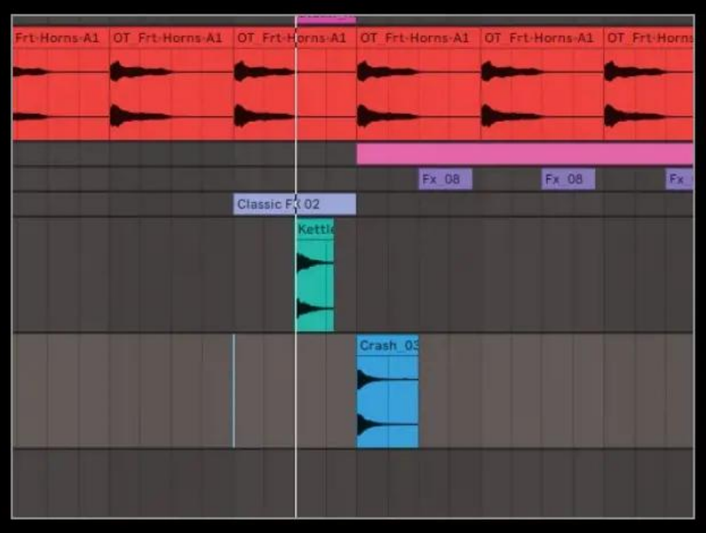
1. Creating a DnB-style track – a rapid-fire guide

7 > To finish our intro, add a horn stab from the samples folder. Place OT_Frt-Horns-A1.wav so it plays every four bars. Reduce the stab's volume to -6dB to blend it in. Copy the drums and horn stabs across to the next 16 bars, to start building the drop. u-he's awesome synth BazilleCM is great for making basslines, so add it to a new MIDI track.



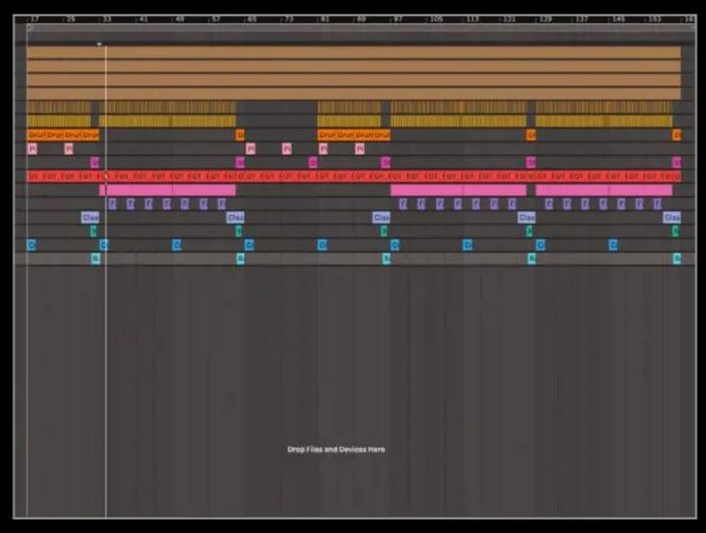
8 > Open BazilleCM, and pick the Psy Subs preset; this is a weighty bass that'll get the speakers flexing. Reduce the volume to -6dB, so the bass doesn't overload the mix. Add Bass1.mid onto the channel, a bass pattern in the tutorial folder. Fill the gaps between the sub bass with a bass sample and load Fx-08.wav onto a new audio track.

9 > Turn down the second bass to -5dB, so it balances with the mix. Now, we'll make a transition from the intro to the drop. Delete the last two bars of drums from the intro, then add Classic FX 02.wav from the Drum n Bass sample folder. This is a sci-fi sounding effect that we can turn into a basic riser by reversing it. Again, reduce the volume to blend it in.



10 > The transition between the sections still sounds awkward, so let's add some perc hits to glue it. Grab Kettle.wav from Drum n Bass folder and place it at the start of our two-bar gap. We'll also add a crash cymbal; import Crash_03.wav, placing it on the drop. Turn down both the crash and impact sounds, till they blend into the mix nicely.

11 > The final piece of our transition puzzle is a vocal snip. Take the sample Another Dimension.wav from the samples folder. Place the sample on the second beat during the gap, then add PSP's cmDelay onto the channel so we can process the dry vocal. Call up the Pipe preset; this adds a ringy, metallic effect to the vocal.



12 > To finish, we'll add some variations to the arrangement. Start by adding a drum edit of your choice at the end of eight, and 16 bars to the drop. Copy the crash cymbal, so it's also at the start of the intro. Duplicate the drop, then delete the last two bars. Copy the edit at the end of the intro across into the gap to create another edit to end the phrase.

RECOMMENDED LISTENING

CALIBRE
EVEN IF
A beautiful piece of production from the Belfast supremo. Amazing strings, warm bass and crisp breaks with a great vocal performed by the man himself.

bit.ly/cal_ei

DIMENSION
RAVER
This 2018 banger channels the spirit of old school rave, with an intro that features classic pirate radio vocals, with snappy drums and an FM-sounding bass.

bit.ly/d_rvr

DBRIDGE & VEGAS
TRUE ROMANCE
One of the genre's bona-fide classics, this is elegantly simple. A sampled break, and handful of stabs leave room for a warm, yet crunchy rolling bass hook...

bit.ly/dbv_tr

BENNY L FT INJA
VANTA BLACKIN
One of last year's DnB anthems, this combines a reverb-soaked foghorn bass, punishing lows and eerie atmospherics with well-timed vocal stabs from MC Inja.

bit.ly/BnyLftI_VB

PRO TIPS

LOW-END THEORY
When writing a bassline for DnB, or most other bass music styles for that matter, it always pays to ensure that at least some of the notes are hitting between E1 and G1. While the notes in a bassline are dictated by what key the track is in, if the bass mainly plays notes above or below this area, it can either sound flabby and low-pitched or too honky and thin.

MIX AS YOU GO
A superb way to make your final mixdown both less daunting and more fun, is to treat mixing more as something you do from the start, and less as a process that follows on from producing the track. Making sure basics such as levels, panning and EQ are on point while you're making a beat, will make the track sound more polished from the word go, while making the final mixdown less of a chore.

Sound design

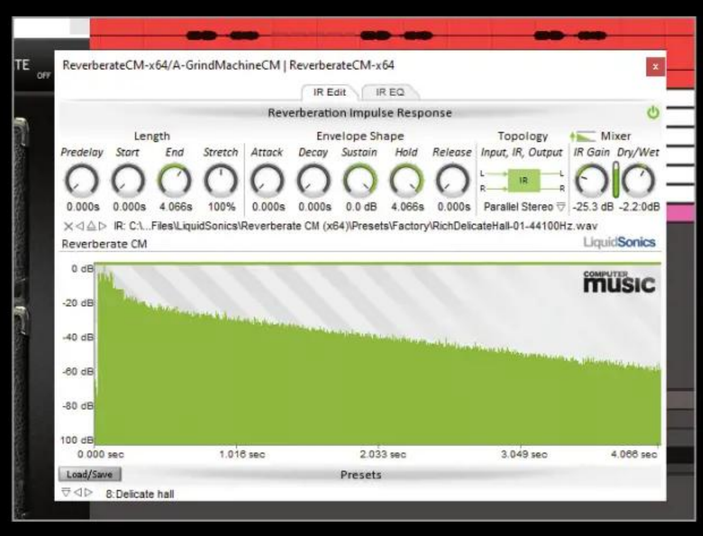
DnB is well renowned for the next-level sound design skills showcased by the top producers in the genre such as Calyx & TeeBee, Noisia and Mefjus, who are all known for creating basses, leads, sound effects and even drums from scratch in the studio as opposed to sampling them from other sources. This dedication to crafting original sounds is what makes one producer stand out from another, and is something that we would recommend you look into a bit more closely as part of your production endeavours.

Sometimes, if you're designing sounds as you actually make a tune, you might find that the creation process of one impinges on the other, reducing your overall productivity and enjoyment. In that scenario, why not try splitting the two tasks into separate sessions? Spending one session solely making sounds using your synths and plugins is not only more focused (and fun, too!) but then gives you a big folder of ready-rolled, fantastic sounds for when you're in your next writing session.

> Step by step 2. Adding bite to your bass

1 > We can use some weapons from the **cm** plugins arsenal to make our DnB bass stand out. Let's start by adding excitement to Bass 2, courtesy of some parallel distortion. Load up Djentbox's GrindMachineCM onto a new return track, and set up a -6dB send from Bass 2.

2 > The benefit of using effects in parallel on a return, as opposed to directly on the channel, is that we can process the wet signal independently of the dry bass. Set the Treble and Mid EQ in GrindMachineCM to 12 o'clock; this gives the distortion a richer, less sharp tone.



3 > Adding reverb will give a similar sound to the likes of Benny L and Loko. Place Liquidsonics' ReverberateCM after our distortion, choosing the Delicate Hall preset. Adjust the End time to four seconds, to reduce the reverb tail. Add more wet signal using the Dry/Wet dial, to reduce overall crunchiness.

4 > To finish things off, we'll EQ the return. Place DDMF's LP10CM after the reverb. We'll use a 300Hz high-pass, and 8kHz low-pass filter to make room for the sub bass, kick and percussion in the mix. Turn the return's Volume down to -3dB, so that the distortion blends into the mix.

> Step by step 3. Dress up your drums

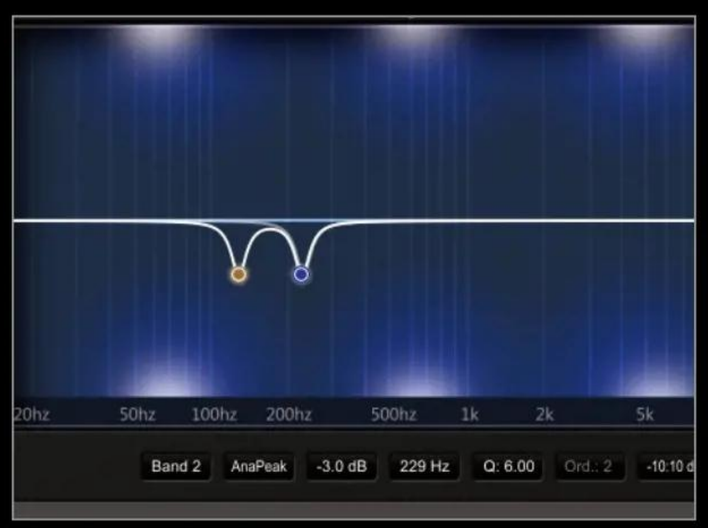
1 > Drawing for some creative effects will make our drums more interesting for the listener during the breakdown and intro. Start by looping over the second 16-bar section of breakdown. We'll group the drums together, so we can process them collectively. Add multi-effect HY-FX CM to the drum group.

2 > Select the Factory 3 preset; this is a filter effect that's modulated by a sample & hold LFO for some added randomness. Automate the Cutoff, so it rises over the entire section. We'll also automate the Filter type, so it switches from low-pass to band-pass filtering over the second eight bars.

3 > Add Inear Display's Litote CM after the filter effect, so we can granulise our drums. Automate the Wet/Dry amount, so it gradually increases to create a futuristic, cinematic-style effect that works well with the breakdown. To finish, we'll automate both effects so they're bypassed for the rest of the track.

> Step by step

4. Perfecting your mixdown, DnB-style



1 > DnB producers pay a lot of attention to their mixdowns, so let's run through some techniques. Start by grouping the basses. We'll use a little EQ on the group, courtesy of DDMF's IIEQ Pro CM, to carve out some more room for our kick and snare to punch through the mix.

2 > Set up a -3dB AnaPeak on Band 1 at 130Hz, with the Q at 6. This makes a narrow cut that corresponds to the kick's loudest frequency, giving it breathing room. We'll also set up an identical cut at 230Hz on Band 2, to create space for the snare's punch.

3 > We'll also apply a -3dB high-shelf at 1kHz, so that the high-mid frequencies of the distorted bass are pushed back from the perc. Next, we group the drums to process them more. Add Sonimus Satson CM to apply subtle, yet needed warmth via analogue modelled saturation.

4 > Let's use ToneBooster's Barricade CM to limit the peak volume of our drum group, giving the mix a more cohesive sound. Set the Attack to 0ms, so that the limiter acts instantly. Pushing the Input gain to 7dB, and Out ceiling to -8dB keeps the balance of the mix intact.

5 > A little stereo width will make our drums pop. Add JST's SidewidenerCM to a new return channel, then set up -20dB sends from the ride, crash and finger click channels. Setting the Mode to 3, Width to 60 and Tone to 80 makes the effect seem brighter, and more exaggerated.

6 > To finish, we'll add a little extra depth and brightness to the entire mix using Acustica Audio's mastering-grade Pink CM. Add it to the master bus then apply a 1dB high-shelf boost at 7kHz, with a 1dB low-shelf boost at 50Hz to get the speaker cones pumping.

Breakbeat science

One of DnB's sonic signatures is the use of chopped drum breaks to create some, or all of, the rhythm track. Originally, the idea of using sampled breakbeats as the drum track came from hip-hop, with breaks used in hip-hop such as the Amen – sampled from The Winstons' *Amen Brother* – and Think break – taken from Lyn Collins' *Think (About It)* becoming staples for most DnB producers.

Want to use breaks? A great tip is to find the best quality samples of the break you want to use. You'll find that most songs containing well-known breaks are available on CD, so you can easily make a perfect digital rip. Another tip is to put your break into mono by picking one leg of the stereo pair, as most live drums are recorded using wide stereo mic techniques that don't translate well into dance music that's mostly heard in mono.

POWER TIP

>Space for bass

A key part of any pro DnB track is getting the relationship between the kick and bass right. A great rule of thumb is to make sure they occupy broadly different areas of the frequency spectrum; typically in DnB, the sub bass will be lowest frequency-wise (around 40-80Hz), with the kick's fundamental frequency above it at roughly 100Hz. If you're struggling, try placing a 200Hz low-pass filter on your master, so that you can hear how the instruments interact, without the mids and tops getting in the way.

The 2000s

The 21st century has seen electronic music encompass just about anything and everything – indeed you could argue that *all* music is now electronic. But still, new genres come and go, while others are reborn with an unashamed nod to the past.

In the 2000s, electronic music is *everyone's* music and there to be consumed – and produced – by all...

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EDM

> Although EDM (electronic dance music) is used as a catch-all term by many in the music scene to describe dance music (particularly in America), it also refers to the kind of big room-sounding music produced and played by the likes of Skrillex, Steve Aoki and Marshmello at huge festivals like Ultra, EDC and Creamfields.

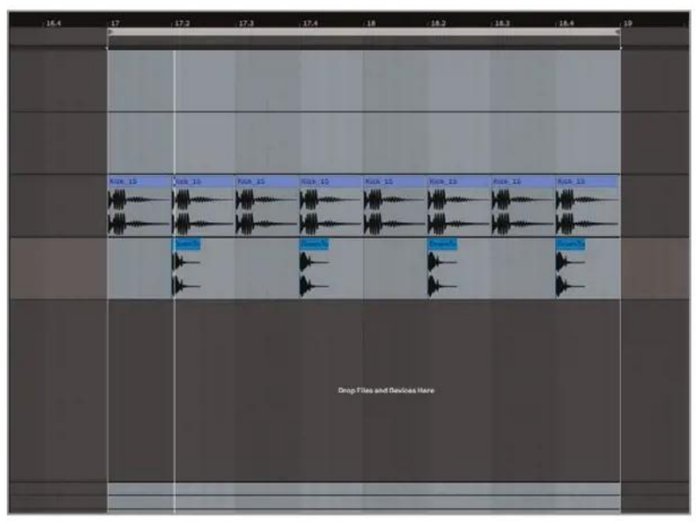
While EDM shares similarities with styles like house, including a tempo ranging from 120-130bpm and the 4/4 drum patterns often used, there's also influence from styles as diverse as dubstep, RnB and pop, clearly heard in the arrangement, synthesis and vocal production techniques used. Although EDM music is heavily pitched towards club or festival situations, the catchy hooks and huge vocal lines make it well suited to commercial radio too, with the concise arrangements of many tracks being made for exactly this purpose.

All of these elements have combined into a well-established music style that's dominating radio playlists and racking up billions of hits on YouTube and Spotify, as well as selling millions of tickets for events every year. If you're looking to start making your own EDM anthems, then we've got your back with our unmissable guide on how you can make your own EDM track for no outlay whatsoever.

Over the next few pages, we'll run through how to create an EDM track using any DAW, the **cm** Plugin Suite and our sample pack, all of which you can find at Filesilo (Bookazines/Music Producer's Guide To Electronic).

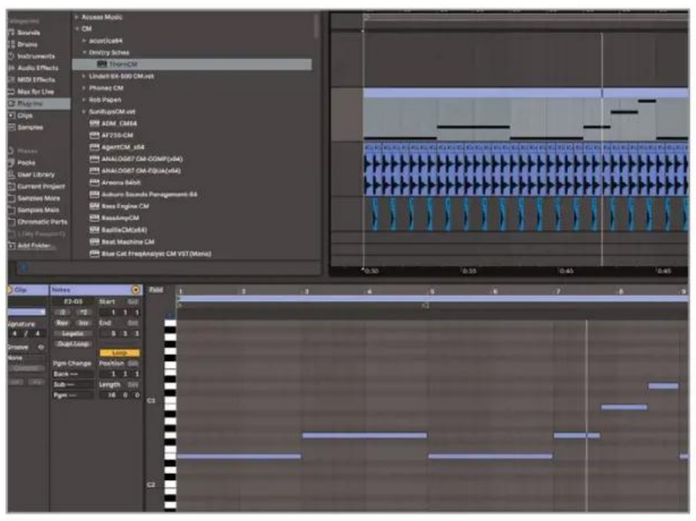
>Step by step 1. Making an EDM composition

1 > Set your DAW's BPM to 128, and build a simple drum kit to lay your musical sounds over. Download the EDM Track Samples and MIDI files folder from filesilo.co.uk and get Kick_15.wav. This is a weighty, EDM-style kick that's a great building block. Reduce it to -6dB to keep your volume right, then copy the kick onto each beat over two bars.



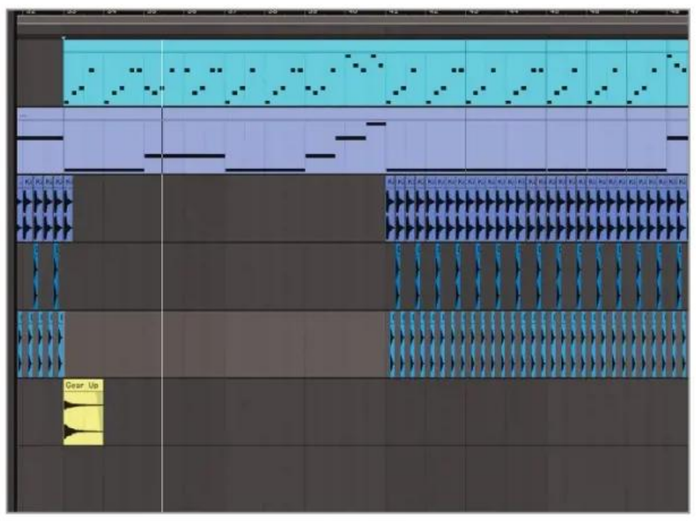
2 > Let's add a clap into the mix. From the samples folder, import DownTown_Clap_01.wav. This is a tight-sounding clap, with a punchy attack reminiscent of a snare. Place it on the second and fourth beats of every bar then lower it to -9dB, so it sits better mixed with the kick. Next, add some percussion parts to give the drum track momentum.

3 > Import 80s_Hat_02.wav from the samples onto a new channel, and duplicate it onto every offbeat. This hat has a tight sound out of the box, ideal for our track. Lower the channel to -9dB to keep the mix balanced. Extend the arrangement to 16 bars. Add Gear_Up_Crash.wav (again from the samples), and place it at the start of the arrangement.



4 > Lower the crash volume, then apply a fade to the end of it to tidy it. Now load the Dmitry Sches' ThornCM plugin (from the instruments folder) onto a new MIDI channel, then select the SEQ Collider preset, a great arpeggiated sequence that we can use for our intro. Import Arp.mid (from the samples folder) to trigger ThornCM, and reduce the channel volume.

5 > We'll stretch our track to a full arrangement. Copy the parts to make another 16-bar section. Add ThornCM onto a new MIDI track, with the Lead-Planet preset selected; this is a huge-sounding lead, perfect for this track. Import Lead.mid onto the channel to trigger the synth, then turn the channel down to -2dB to keep the levels in check.



6 > Delete all of the snare and hi-hat audio from the first eight bars of our second section, so that the lead takes precedence. Mute all the kicks, except for the first one that we'll turn into an effect later on. We'll begin by making a build by looping over two bars of the arpeggiator and lead during the second eight-bar section, decreasing this to one bar for the last four.

RECOMMENDED LISTENING

MARTIN GARRIX
ANIMALS
This 2013 smash announced Martin Garrix to the world, with its slick production and arrangement accenting the unmissable lead synth line.

bit.ly/mg_anmls

DEADMAU5 & KASKADE
I REMEMBER
A beautiful piece of production, with warm synths and crisp perc complementing the haunting vocals perfectly. Definitely an EDM classic!

bit.ly/ddmskskd_ir

SWEDISH HOUSE MAFIA FT JOHN MARTIN
DON'T YOU WORRY CHILD
Commercial music fan or not, you won't have escaped this monster, with big synths and possibly the catchiest vocal of the 10s.

bit.ly/swhm_dywc

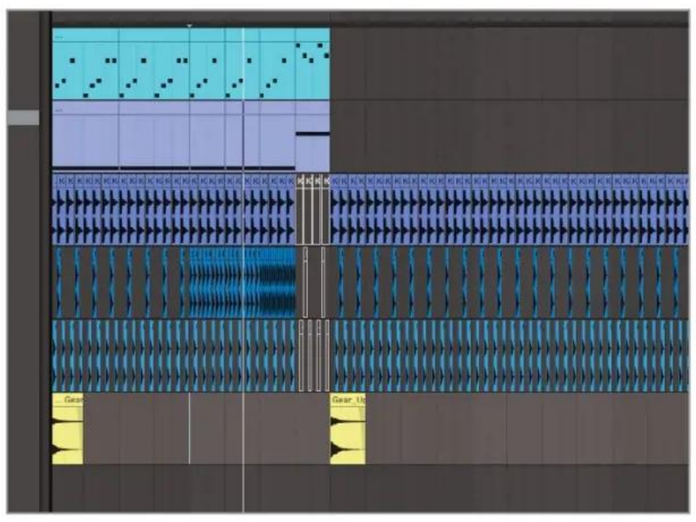
AVICII
LEVELS
The legacy of the late Tim Bergling (aka Avicii) as one of EDM's finest players lives on, with tracks such as *Levels* now considered to be genuine classics.

bit.ly/avc_lvls

PRO TIPS

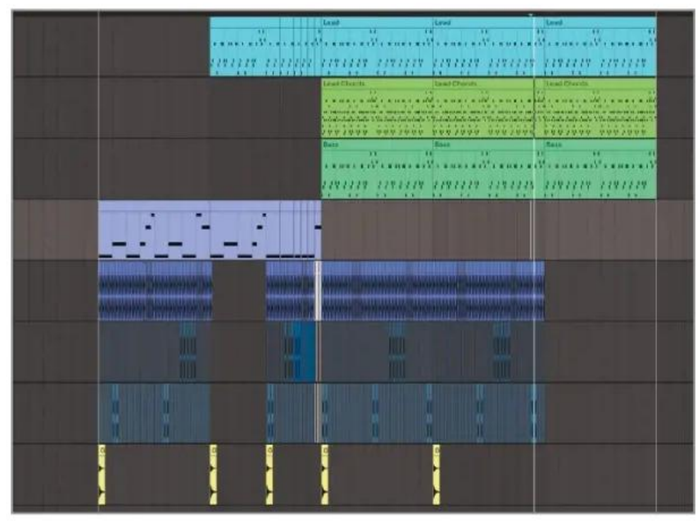
DE-ESSING BLESSING
If you're using EDM-style one-shot effects or risers from the likes of Loopmasters or Vengeance, you might find that they start to add harshness to the high-mid frequencies of your mix, particularly when layered. Deal with this issue dynamically by grouping the effects, before applying de-essing. This effect, normally used for vocals, will remove the harsh high-mid frequencies only when its threshold is breached, giving a more natural sound.

SIZZLING SYNTHS
The kind of synths frequently used in EDM production have a full-range sound that, while filling the mix nicely, can cause harshness or frequency clashes in the bass and high frequency areas. Taking time to EQ these areas will give a smoother overall finish, while leaving room for the bass, kick and percussion to do their thing without unpleasant masking, giving your mix a fatiguing overall sound, particularly on a PA system.

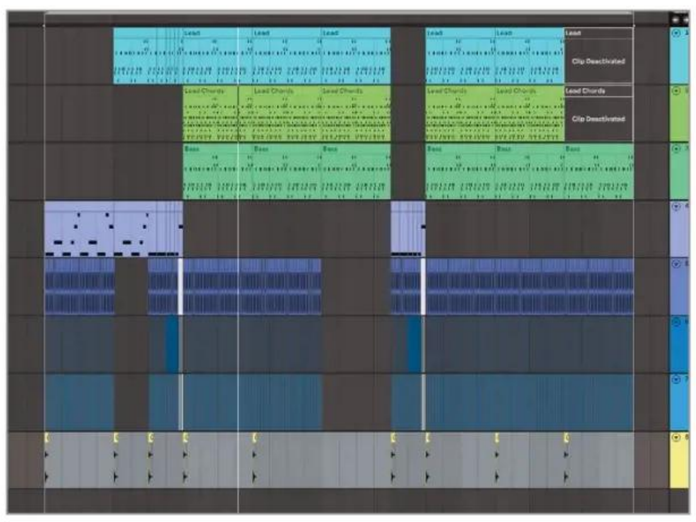


7 > Copy the crash cymbal over eight bars across, so it hits when the drums return. We'll mute the drums entirely from the last bar, giving the lead added impact before the drop. Create a clap build over the last four bars, so the clap picks up pace. Now, we'll duplicate the drums from the first 16 bars after the build section, so we can work on the drop.

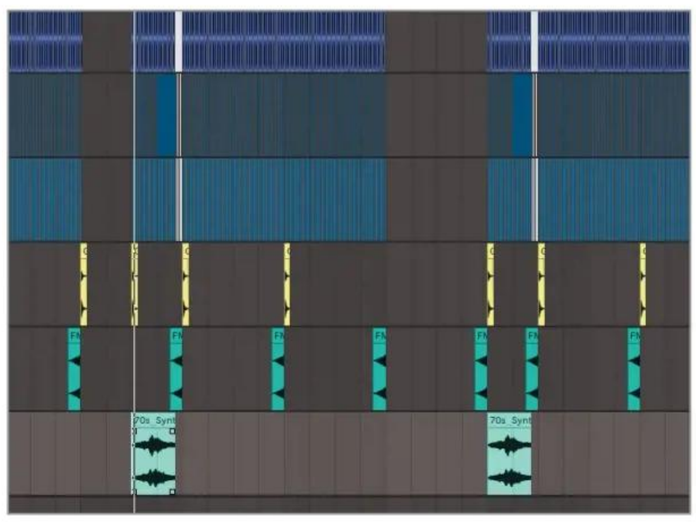
8 > Import Lead.mid onto the lead channel for our drop. Add a new MIDI track, with Synapse Audio's DuneCM loaded up. Drop Lead Chords.mid onto the track; this is a chord progression we've made to back up the lead line. Load the VengeanZ RL preset in DuneCM; a fat, unison, detuned lead to beef up the drop. Reduce volume to -7dB to keep balance.



9 > A synth bass will fill out the frequencies below the lead sounds, adding weight. Add a new MIDI channel, with Bass.mid loaded onto it. Call up u-he's BazilleCM, and select the Purr Bass preset. Now, copy the entire drop section so that it's 32 bars in length. We'll duplicate the lead, chord and bass MIDI parts again to start creating the breakdown.



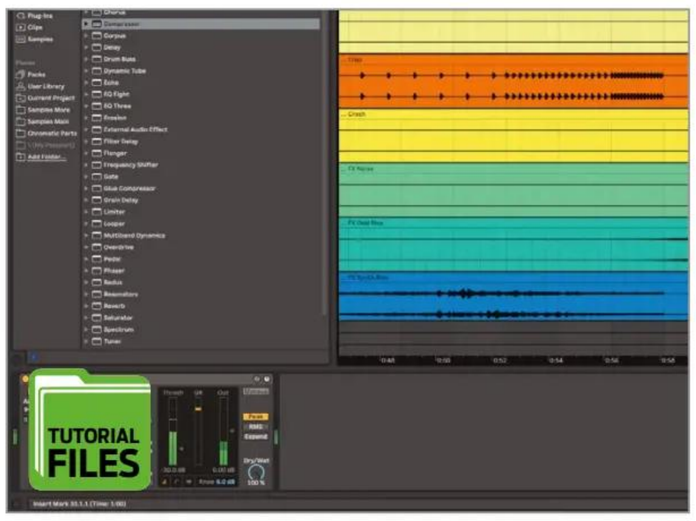
10 > Grab the second eight bars of our build section, and copy it across to go after the breakdown. Place a crash cymbal at the start of the breakdown, then grab the drop audio/MIDI and place it after the second build. After duplicating the last 16 bars of the second drop, mute the lead and chords MIDI to create a cooled down final 16 bars to finish the track off.



11 > Let's add effects. Import FM_Odd_Sting.wav onto a new channel, then reverse and place it at the end of each 16-bar section, making a subtle riser. Place 70s_Synth_Rise.wav from sample folder under both build sections to add atmosphere. Delete the last bar of the synth rise, then lower both effects to -3dB to preserve mix balance.

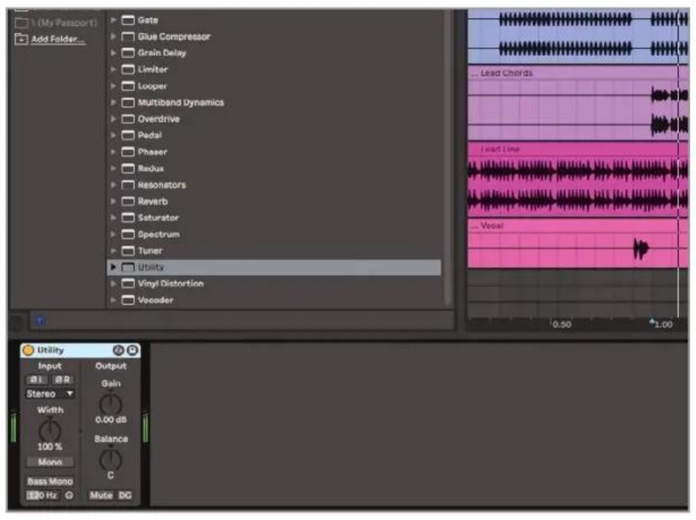
12 > A noise burst on the drop gives character. Place TapeNoise03.wav from the sample folder on the second beat of the drop. Fade out the audio, so the burst reduces to silence. To finish, add a vocal snip; grab Make_some_noise.wav and place it directly before each drop, pitched down by five semitones.

> Step by step 2. Sidechain gain: an EDM staple

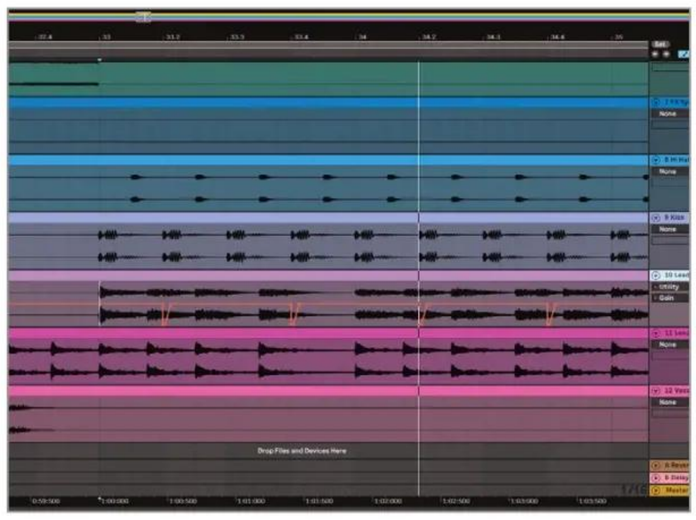


1 > Sidechain compression is an integral part of EDM, so let's put it into action in our track. Start by loading a sidechain compressor onto the FX Noise channel, with the kick selected as the trigger. Reduce Attack to its fastest, then set the Threshold at -30dB to increase the effect.

2 > Some sidechaining helps the bass and kick gel together. Copy the plugin from the FX Noise channel to the Bass channel, then reduce the Release to 20ms, so the ducking effect ends more quickly. Increasing the Ratio to 4:1 gives a more brusque sound to the effect.



3 > While sidechain compression using a dedicated plugin with sidechain input is simple and effective, sometimes it's more precise and controllable to instead program in the ducking effect using automation of a utility plugin; let's try this out for our lead chords. Add any utility plugin onto the Lead Chords channel.



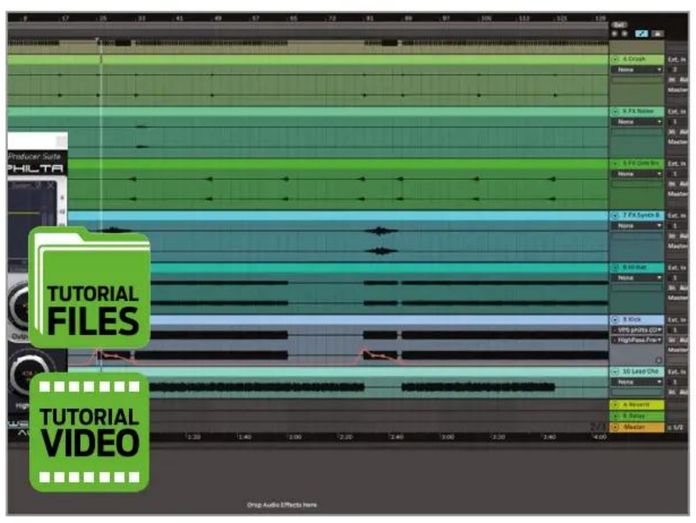
4 > We'll draw in automation of our volume on beats 2 and 4 of each bar, so that it ducks the lead chords when the clap hits. Copy the automation so it's on both drops. Now, when you bypass the plugin, you'll hear that the clap doesn't pop out as much.

Sidechaining

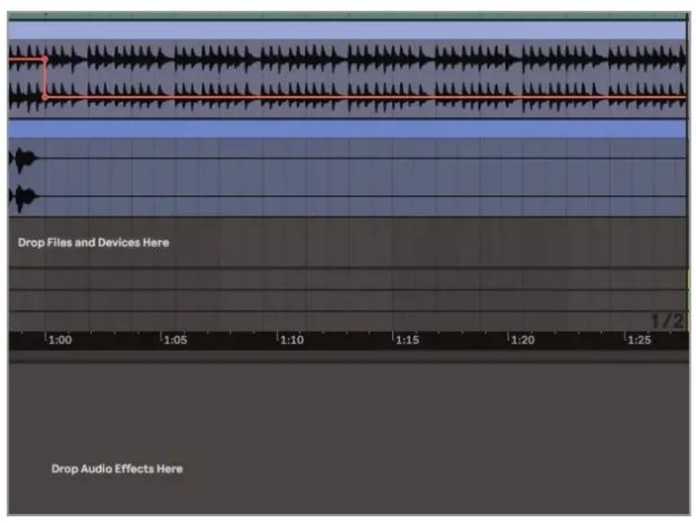
A huge part of the production style of your favourite EDM anthems will be the use of sidechain compression in order to rhythmically change the volume of elements such as synths, bass or even vocals using another element in the track as the sidechain trigger. This can be particularly beneficial when producing music such as EDM that'll be later mixed and mastered to extreme levels of loudness, as dense sounds like lead synths or bass can be made to fit around the other parts of the song.

This technique will be familiar to most of us, as it's used heavily in contemporary genres ranging from house music, through to dubstep and beyond. While sidechaining is often used as a creative volume modulation technique, the main reason that sidechaining is so ubiquitous in dance production is because it's a simple way of moving one element away from another, creating extra headroom for important parts like the kick, snare or bass to take their rightful place in the mix.

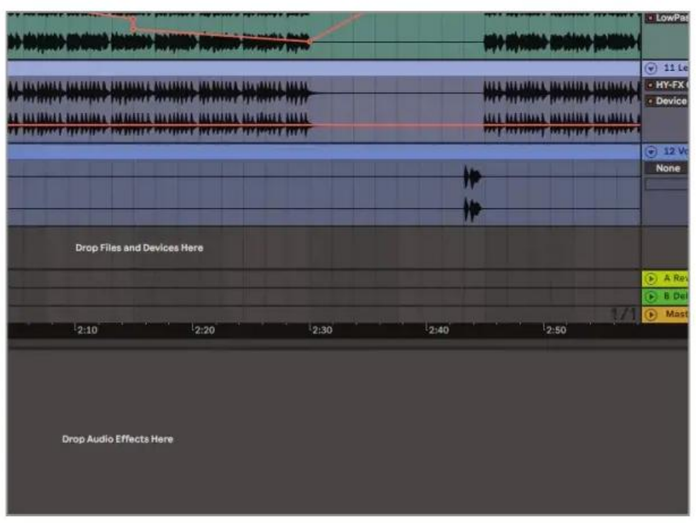
> Step by step 3. Automation nation



1 > Embellish the arrangement by automating some filters. Add Vengeance's VPS PhiltaCM to the Kick channel. High-pass filter the kick using some automation for the eight-bar build prior to the drop, so the bass fades in. Copy the automation to the second build.



2 > Adding a cool multi-effect to the lead line for the one-bar gap before the drop adds impact to the drop. Add HY-FX CM onto the channel, then select the Factory 03 preset, which adds cool filter modulation. Automate the effect so that it's bypassed except at this point.

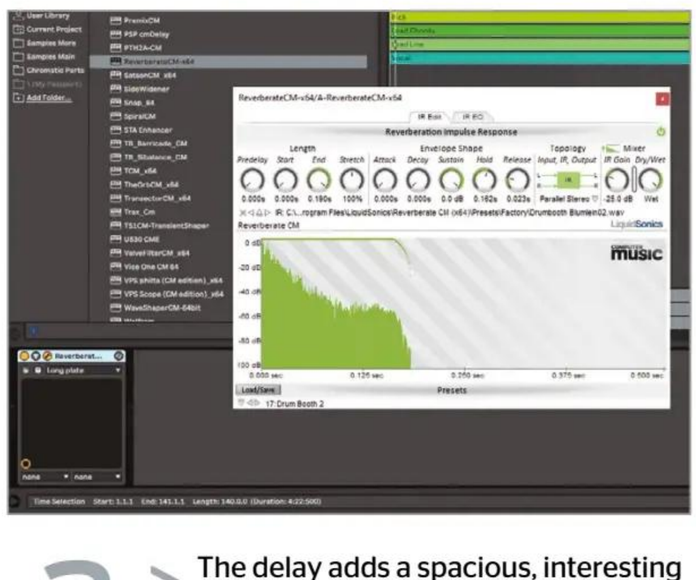


3 > To finish up, filter the lead chords in the breakdown. Add VPS PhiltaCM onto the channel, then set the Slope to 48dB/octave for a sharper sound. Draw in some automation of the Low-pass frequency across the 16-bar section, so that the high frequencies fade out as the breakdown unfolds.

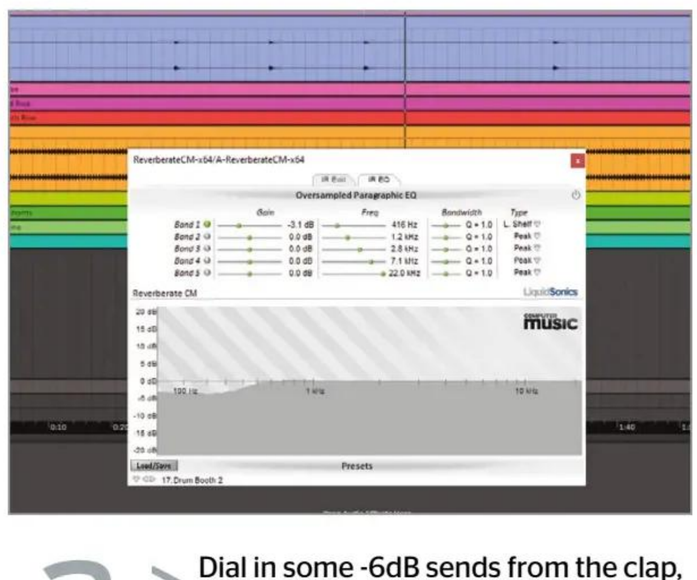
> Step by step

4. Mixing down your EDM track

1 > Let's start with a crash. The right channel is stronger than the left, so isolate it using a utility plugin. Load the plugin, and set the channel mode to Right, turning our crash into a mono sound. Add an 1/8th note delay, with the Dry/Wet mix at 40%.



2 > The delay adds a spacious, interesting feel to the crash while adding detail to the overall arrangement. Next, add reverb to the percussion and clap. Add Liquidsonics Reverberate CM onto a return track with the Drum Booth 2 preset loaded. Set the Dry/Wet control to full wet.



3 > Dial in some -6dB sends from the clap, crash and hi-hat to the reverb return track. You'll hear that the reverb is quite short, adding reflections without swamping the mix. Use Reverberate CM's low-shelf filter to make a -3dB cut at 400Hz, increasing low frequency clarity.

4 > Next, we'll add an EQ boost to the kick, so it cuts through the mix better. Load DDMF's LP10 CM onto the channel, and dial in a 3dB peak boost at 1kHz; you'll hear the kick poke through the mix. Now, group the lead chords and lead line.

5 > Add Eareckon's excellent CM-EQUA 87 to the lead group, and set the low-cut filter to 200Hz to make room for the kick and bass. A -2dB high shelf HF cut at 1.5kHz will dull the natural sharpness of the synths, making extra space for the percussion to shine.

6 > To finish, we'll use limiting to rein in our spiky lead line. Add ToneBoosters' Barricade CM to the channel, then set the Out ceiling to -5dB to get around 3dB of peak gain reduction. You'll hear the synth instantly gel with the mix, with extra room for the percussion.

Simplicity is key

Ever wondered why EDM tracks sound so massive? The answer is (literally) simplicity itself. Unlike styles like drum&bass that are constructed from painstakingly-layered drum, bass and lead sounds, EDM is constructed using bigger sounds, but fewer of them. This means that each sound has more room in the mix, and there's also more room for the trademark effects such as reverb and delay that are coated all over EDM sounds.

So, if you're feeling like your track isn't sounding big enough, what can be done? Firstly, we'd recommend selecting naturally bigger sounds as a starting point. While a subtle layer or processing can give the desired effect, you'll find that elaborately constructed layered kicks, snares and basses won't sound as powerful in comparison to naturally big sounds.

For big EDM sounds, keep things simple

Equally, while a bit of distortion or similar will beef up your synths, it's always worth looking at applying a bit of unison detuning or similar in the synth itself for a naturally huge sound.

POWER TIP

> For reference...

When you reference your EDM tune in mono, you may find that those huge synths sound weak due to phase cancellation, leading to an EDM track that lacks power when played back on festival/club PA systems, FM radio or even your iPhone. In this situation, use a mid/side plugin such as Voxengo's fab freebie MSED, which splits the stereo left/right signal into its mono and stereo spread components, to boost the volume of the mid (mono) channel accordingly, adding mono weight without compromising on stereo width.

Photo: Steve Gullick

JON HOPKINS

Where Electronic Music goes in the 21st century is anyone's guess, but Jon Hopkins is doing his best to lead us there

> As a young lad growing up just outside London, Jon Hopkins decided he was going to learn to play the drums. But, as he sat down behind the kit, he realised there was something wrong.

"The kick drum sounded weird," he remembers. "Every time I played it, it sounded different. I didn't want that. I wanted every kick to sound the same. I wanted a kick drum like the one that I heard on the radio... on songs like MARRS' *Pump Up The Volume* and D-Mob's *We Call It Acieed*.

"I didn't know it at the time, but it wasn't really a drum kit that I was interested in. It was a drum machine."

Although the 42-year-old Hopkins now regrets hanging up his 'sticks' – "it would be brilliant to play live drums on stage!" – he acknowledges that this natural affinity with electronically-generated sound overshadowed his early years. He was a gifted, self-taught classical pianist, but could never really escape the lure of synthesisers... and the giddy joy of audio experimentation.

"I suppose it was a big hint of what was to come," says Hopkins. "A musical signpost to where I was headed."

At 17 and straight out of college, Hopkins was already employed as a touring keyboard player, but also working on a bunch of tunes that became his 2001 debut, *Opalescent*. Although it was, for all intents and purposes, an underground album, it had an immediate impact, and Hopkins spent the next few years hanging out with the likes of Brian Eno, David Holmes and Coldplay – he was co-producer on their 2008 album *Viva la Vida*.

There were soundtrack albums (the 2010 Brit sci-fi movie, *Monsters*), collaborations (the Mercury-nominated *Diamond Mine* with King Creosote) and American success for his 2009 album, *Insides*.

As he continued to branch out, critics struggled to find a convenient label for Hopkins'

music. His 2013 album, *Immunity*, was often called 'techno', but also featured delicate piano and early-morning ambience. And it was the same with 2018's Grammy-nominated and top 10 album *Singularity*. Aphex Twin, psychedelia, glitchy, EDM, IDM, heart-breaking, dystopian, brutal, beautiful, classical... are all words you'll find in *Singularity* reviews.

And Hopkins himself opts for something much simpler: "What do I call my music? Beats with melodies."

'Eclectic' is an overused word, but it's hard to listen to a Jon Hopkins album without reaching for it. Is that how you've always made music?

JH: "I can honestly say that I have never thought of music in those terms. A bit of this, a bit of that. I'm someone who believes in instinct. If I have a method, that's it. Follow your instinct. Don't worry about whether this piece of music is meant to fit with that piece of music. If it feels right in your head, that's all you need.

"If the music has been shaped by anything, it's probably the availability of equipment at the time. Limitation. For the first ten years, I was working with a very limited setup... Cubase, a pirated copy of Sound Forge, a pirated Juno VST and a couple of bits of hardware. That was all I had when I was trying to find my sound and, looking back on it, those limits turned out to be quite useful."

We hate to bring his name in so early, but your mate, Brian Eno, has often talked about setting limits in the studio.

JH:"Probably the main thing I learned from working with Brian is the importance of accidents. If the music seems to be going off in that direction, let it go."

Do you still try and limit yourself in your work today?

JH: "Difficult question. I think I'd find it very difficult if I was coming into music today. Even if you've only got Ableton Live, just look at all the options you've got. You can do so much. You've got infinite choices. If you're not careful, you start running around like a headless chicken.

"When you've got hardly any equipment, very little money and no access to any information, your sound is very much dictated by you, your setup and what you're listening to. Nothing more."

"You could possibly argue that I limit the music as I'm writing. I strip back all the unnecessary rubbish. I think you can hear that on the last album – the rhythms definitely felt simpler. I was really just looking for a nice groove, instead of some over-programmed, glitchy IDM thing.

"Removing stuff has become a big part of the way I work. If I've had a day writing, I sit down the next morning and start taking out the rubbish. The bits where I've got too fiddly and complex. All the additional detail that you think a song needs. Take it out. Get rid of it."

> "I'd find it difficult if I was coming into music today. You've got infinite choices. If you're not careful, you start running around like a headless chicken"

You're obviously a very good piano player, technically speaking, having attended the Royal College of Music from the age of 12, studying Stravinsky and others. So it stands to reason that you could very easily rustle up a tune with thousands of chord changes and elaborate prog rock-style melodies. Does that side of your musical brain ever take over and dictate what kind of music you write?

JH:"I don't think it takes over, but it does creep in, which is why I have to chip it away as a song takes shape. Most producers make 100 songs and choose the best 10 for the album. I make 100 songs, but that will be ten different versions of the ten songs that are going on the album. Each time I make a new version, it gets stripped back. I take away more notes; take away more of the beat.

"The most sonically complex song on *Singularity* was probably *Neon Pattern Drum*. The earlier versions were far heavier and much more experimental. You might think that makes it sound more interesting, but it wasn't. It was unsatisfying. Wildly spinning away from the core aesthetic. Yes, I like experimentation, but I also want my songs to be accessible. Complexity and melody working together."

Did you ever consider going full-on classical musician after you finished at the Royal College of Music?

JH: "As a kid – and after I went to college – I was aware that there had always been two strains of music running through my life: the classical piano thing and the free-form, electronic thing. As far as I had been concerned, they were miles apart, and there was very little chance of them ever meeting.

"There was a studio at college, but we were only allowed about an hour a week in there. An hour doesn't give you enough time to finish anything, which meant there was no end result. Being in the studio didn't amount to anything. On the other hand, if you're good at piano and you can play a particular piece, you've got your end result right there.

"At 12 or 13 years old, kids tend to do what they're told. I was being pushed towards the piano and I eventually found a very inspiring piano teacher. She wasn't much older than me – probably in her early 20s – and she finally got me to understand the piano. And I'm glad she did, because it came in very useful over the years. Dexterity, finger technique and all that.

"But, the older I got, the more I realised that the piano side of things was existing completely independently from the electronic side. And the electronic side was where I felt most comfortable. At 17 years old, when I finished my exams, I had already decided that I didn't want to study any more. I wanted to make music with my computer.

"And that's what sort of happened. Thanks to my friend, Leo Abrahams [Abrahams was at the Royal College of Music with Hopkins and has worked with the likes of Brian Eno, Karl Hyde and Grace Jones], I was offered a job with Imogen Heap's band, playing keyboards. I was straight out of college and earning 100 quid a week. Unheard of these days!

"They even allowed me to pick a keyboard, so I asked for the Korg Trinity, which I'd been reading about in *Future Music*. There was no way I could afford a two-and-a-half-grand synth, but I had one bought for me.

Photo by Nick Pickles/ Redferns via Getty Images

Jon Hopkins at Brixton Academy in April 2015

Jon in his East London-based studio

"There was also an Akai S3000 sampler, so I was learning how to fire in samples, too. Of course, all of this experience was feeding back into my own music. I was allowed to take the Trinity home in between tours, so that found its way into my setup. Finally, I had the basics of a home studio."

You mentioned Cubase software. That was your platform at the time?

JH:"Ha ha! Let's go back even further. When I was maybe 12 or 13, I had an Amstrad CPC, but you could only make one square wave with that. Not what you'd call a musically creative computer! So I switched over to the Amiga, with a program that I'm sure a lot of readers will remember... OctaMED. Between four to 16 columns of numbers, with 8-bit sample facility on the first four channels. Sampling! Adding bits of my favourite tracks from record and tape. Chopping up sound.

"All with no instructions! I'm not telling you that because I'm trying to prove how great I was; I guess that what I'm trying to say is that everything was done by feel and instinct. There were no instruction manuals. The bottom line was, 'Does it work?' I had no idea if what I was doing was technically correct. I just wanted to make music that got me excited.

"OctaMED had MIDI, too, which meant I could look outside the computer. I was probably 15 when a mate of mine asked me if I wanted to buy his Roland D-20. Oh, yes! That was it... I was sequencing my own music. It was such an exciting time.

"Unfortunately, after a few weeks, I found out that my mate wasn't actually authorised to sell the Roland, so I had to take it back and hand it over to his dad."

Ouch!

JH: "I know! I can't tell you how disappointed I was. I think that was one of the moments when I realised how important music had become in my life. I was heartbroken over the loss of a Roland D-20.

"It took a long time to save up for my next synth: a Yamaha SY77. Yes, it allowed me to dig deep into FM synthesis, but the effects unit was crap. I was already into the idea of huge reverbs and delays, but the 77 had a somewhat underwhelming 300ms of delay.

"That's the thing I still struggle to get my head around these days... the difference between then and now. Back then, if your synth only had 300ms of delay, that was it. I knew what I needed to make the music that was in my head, but I literally couldn't afford it. I could not afford the Lexicon I wanted. Today, the idea that you can't afford a reverb or a delay... it's hilarious!"

> "I knew what I needed to make the music that was in my head, but I literally couldn't afford it"

Presumably, you saw the move 'onboard' as a huge leap forward, then? I mean, plugins

Kit list

HARDWARE

Apple MacBook Pro (2.2Ghz Core i7, 16GB RAM)

Moog Sub Phatty

Korg Trinity and MS-20

Yamaha SY77

Korg Kaoss Pads for live

Upright grand piano

Focal Twin 6 BE monitors

Focusrite Clarett 8 Pre

SOFTWARE

Ableton Live

Soundtoys Decapitator and EchoBoy

NI Kontakt/Nils Frahm Una Corda

Goodhertz Vulf compressor

SoundHack +Bubbler Delay

Waves Renaissance EQ/ Reverb/SuperTap Delay

Audio Ease Altiverb

Jon's Moog Sub Phatty helped achieve *Luminous Beings*' warm bass sounds

That big, broken Jon Hopkins sound

"For me, there have always been two sides to electronic music. There's the ethereal, weightless side; and the dark, filthy side. And, yes, I like things to sound... big. How do I get that sound? Massive amounts of processing for the filthy side. Lots of Soundtoys Decapitator – and I mean lots! Boosting the bits that you think are just noise. Boosting the mistakes. Using Ableton to really dig into the details of the sound, so I can pick out artefacts that aren't even supposed to be there. Boost them. And distort them again.

"At the ethereal end of the spectrum, start looking at the stereo spread. I constantly play around with the width of a sound, starting in mono and moving things out into wide stereo... vast stereo!

"Then you set the two against each other. Start a fight and see who wins."

Photo: Steve Gullick

weren't really cheap in the early days, but they were certainly cheaper than the top-notch hardware.

JH: "Actually, it was the whole 'recording audio' thing that got me working inside the box. After the Amiga, a computer genius friend of mine built me a PC and I moved up to Cubase. I could record audio and, very quickly, I found I was leaning towards that way of working. As soon as I'd got the right notes in MIDI, I'd print it. I had the confidence to say, 'I'm not going to change that bunch of notes'.

"I was using Sound Forge at the time, which meant that I could destructively apply plugins to the audio, so that I still had some control over the sound. But I liked the idea that I'd applied a small full-stop to that bit of the song. It was in the computer and I was safe. I wasn't going to lose it.

"Conveniently, I also found that I liked editing audio. I could get strange results. Sounds that I couldn't get with MIDI programming. Chopped up reverbs and delays. Weird cut-offs.

"I've not gone fully native. I still like hardware synths. It's not a point of principal. I just like the sound of a real synth."

Grammy nominations, decent album sales. No doubt you've treated yourself to a few synth goodies?

JH: "That was always the plan, but it never happened. I've got my SY77, Moog Sub Phatty, the Trinity – which I never gave back! – and a Korg MS-20. All running via Ableton Live.

"I went from Cubase to Logic, but moved to Ableton after they rebuilt the audio engine. Up until that point, I had a real problem with Ableton because it sounded like... Ableton. Now, you've got a sound that's as good as Logic, but you've also got the power of Ableton. For me, it's the most incredible piece of music software that's out there."

And plugins?

"Altiverb has been a good friend to me over the years. EchoBoy is amazing. I invested in a Waves bundle because I like the sound of the Renaissance reverb and EQ. The Vulf compressor from Goodhertz is very nice. There's some great freeware out there, too.

"I'm really enjoying using Bubbler, which is a superb granular delay. I've been using it to generate pads out of... well, you can make a pad out of anything. It's been years since I've actually used a pad preset on a synth. Even a simple piano can make a harmonically complex pad, and it's a lot more fun than just pulling up the same old pad preset."

The piano is and seems to have always been a recurring theme in your music. Is the one you use real or digital?

JH: "I've got the same upright grand that I've had since 1989, permanently miked up in the studio. I have tried a few piano plugins, but they all sound like the M1 piano to me. The first one that I've felt comfortable with is Nils Frahm's Una Corda, which is a Kontakt instrument. Nils and I share the same piano-playing aesthetic of hot miking and soft playing. It was used on the album – at the end of *Luminous Beings* – and it's my main live piano."

How do you go about transferring your sound to the live arena?

JH: "*Singularity* was the first album I recorded using Ableton Live, which made the live show a lot easier: Ableton plus a couple of controllers, with the audio sent out to Kaoss pads. That allows me to do anything I want to do.

"I suppose the odd thing is that I don't really consider myself a dance music artist. Although there are elements of dance in the live shows, I'm not really trying to create a full-on party. I can extend sections and I can respond to the crowd, but I don't like the idea of turning my music into something that's unidentifiable. I want people to know which song I'm playing when I play it."

There is more information about Jon's latest projects at jonhopkins.co.uk

HEAR MORE

Singularity
bit.ly/jh_sing

Open Eye Signal
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BASSLINE

> Bassline music (also known as bass house) has been storming clubs and festivals worldwide over the last few years, with artists such as Holy Goof, Chris Lorenzo and Skepsis making music based on the classic sound of bassline tracks from the mid to late 2000s.

Their technique is to then add their own twist, taking influence from production methods and sounds used in styles ranging from rave, techno and grime through to jungle and DnB. Bassline tracks are produced with the dancefloor squarely in mind, boasting EDM-style drops, weighty sub bass, extreme mid-range and detuned mid synth leads, all creating a sound that can be intentionally abrasive but never fails to cut through in the rave. As the original bassline sound itself took inspiration from speed garage and uplifting vocal house there are strong influences in today's bass tracks from those styles, both in terms of the tempo which usually sits between 128-140bpm, and the energetic 4/4 drum beat.

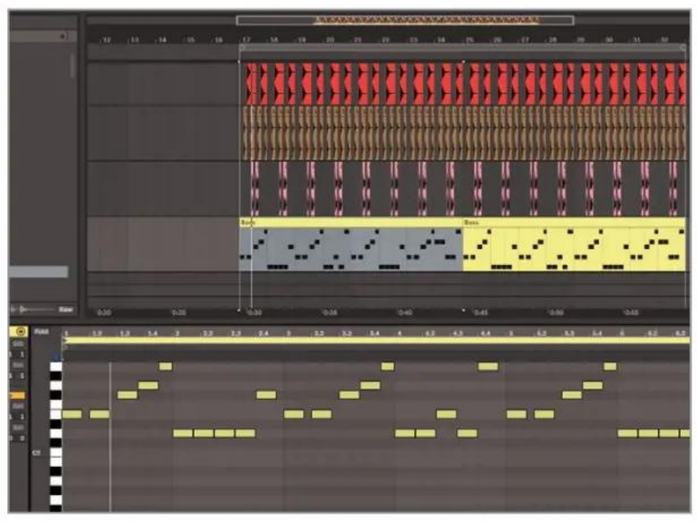
If you fancy making your own bassline track, then we've got your back with our guide on how to produce one here using just your DAW, the **cm** Plugin Suite and samples from the Music Producer's Guide To Electronic folder at filesilo.co.uk (under Bookazines). We'll run through drum-making techniques, mid-range bass synthesis, arrangement ideas and all the other cool stuff you need to make your own bassline track. Videos and tutorial files are also available in the folder at filesilo.co.uk.

>Step by step 1. Bassline in 60 minutes

1 > Let's get started by making the drop for the track. Set your BPM to 130, and grab Chase_Kit_Kick09.wav from the samples folder; this is a beefy kick we can use for building our drums. Add it to an audio track then shorten the tail slightly, with a fade out to avoid any clicks or pops. Duplicate the kick sample, so it's placed on every beat of the bar.

2 > We'll turn the kick down to -6dB to avoid clipping. Next, we'll build a layered clap and snare to go on beats 2 and 4 in the bar. Add DownTown_Clap_02.wav from the samples folder, then turn it down to -10dB so it doesn't dominate the kick. Import Vice_Snare_09.wav from the same folder to layer with the clap; turning it down substantially gels the two layers.

3 > Some percussion will flesh out the kick and snare. We'll place a hi-hat from the samples folder (Load_Up_ClosedHat.wav) on every off beat, then turn it down to -6dB. Import a drum machine loop from the folder (CD_Drums_95-17.wav) onto a new track. We'll delete most of the loop, so that just a cool shuffle between the snare hits remains.



4 > Turn down the shuffle we've just added, so it is just a subtle part of the mix. Next, we'll stretch the one-bar drum loop out into a 16-bar section. Now add some synths with Synapse's Dune CM on a new MIDI track. From the tutorial folder at filesolo.co.uk Load Mid Bass.fxp – a bass patch we've pre-made – and add Bass.mid onto the MIDI track, to trigger it.

5 > To give the bass real power, we add a booming sub bass courtesy of u-he Bazille CM's Psy Subs preset. Turn down mid and sub basses to -9dB, so they don't sit in front of the drums. Add Audiffex STA Enhancer CM to the mid bass, with the Vintage XCiter preset loaded – this adds density, and harmonic excitement to our synth patch without going too crunchy.

6 > Let's make a variation on the bass, to use as a fill. Duplicate the Mid bass channel, then delete the MIDI clips. Move the last bar of MIDI to the duplicate channel, so the new synth is triggered at the end of the phrase. Open Dune CM, and change Osc 2's waveform to sawtooth, with the FM 1 dial at 20%. This makes our patch change to a more ringy sound.

RECOMMENDED LISTENING

SKEPSIS - *GOES LIKE*
One of bass music's biggest tracks in recent years, the mid bass in *Goes Like* is so sharp that it could cut titanium, while thumping drums keep the track moving along.

bit.ly/skpss_glt

DARKZY - *IT'S YOU*
Trance-tinged vocals and pads kick this off, into a savage drop that combines screeching bass and weighty drums. Undoubtedly one of Darkzy's best bassline tracks to date.

bit.ly/dkz_iy

DRAKE - *GODS PLAN (HOLY GOOF BOOTLEG)*
This took Drake's hit and turned it into a massive, bass-heavy banger by adding in some huge synths, fat drums and lashing after lashing of sound effects.

bit.ly/drk_gp_hg

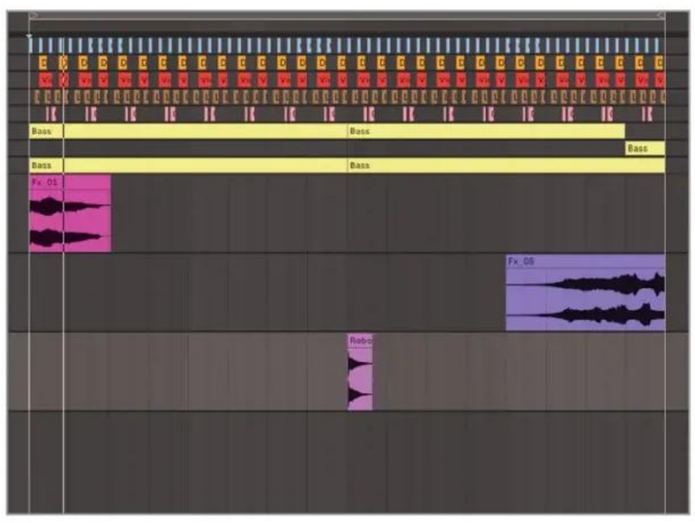
BRU-C FT WINDOW KID, JAMIE DUGGAN AND BOODA - *WEEKEND BOYS*
The original Niche vibe is bang up to date for this, with witty vocals from MCs Bru-C and Window Kid the track's main focal point.

bit.ly/brcwndwkd

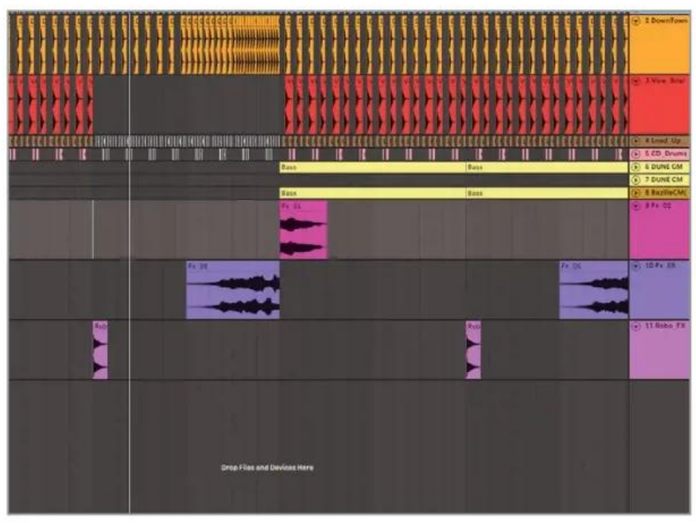
PRO TIPS

ALL IN THE TIMING
You can change the feel of your drums quite dramatically by using your DAW's channel time delay on various layers. This lets you make subtle timing changes by shifting sounds ahead, or behind the grid by milliseconds at a time. For example, try time delay to shift the offbeat hi-hat 5ms ahead of the grid to give a more urgent feel. Time delay is also great for shifting snare/clap layers to make them gel.

THINLY SPREAD
The kind of complex synth lead and bass sounds used in bassline (and many other dance styles for that matter) are often synthesised using unison detuning, alongside effects like reverb or stereo excitement. This can sometimes impact on their mono compatibility, which is not ideal for club PA, or smartphone playback. To get around this, try adding extra mono weight by mixing in mono saturation or distortion of your synth parts on a return channel...

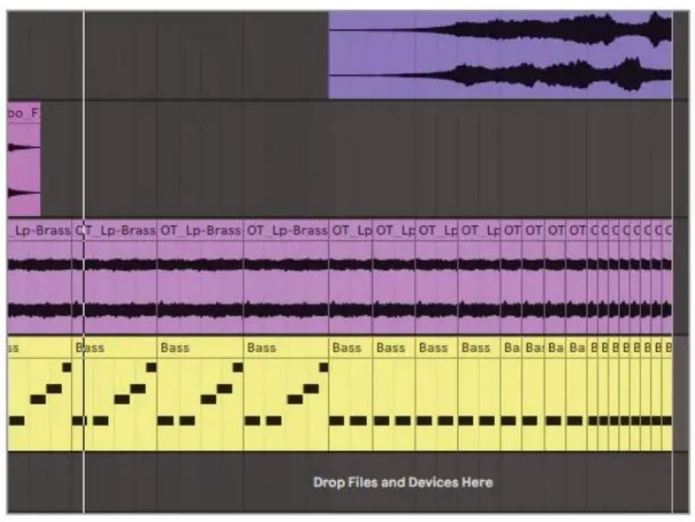


7 > We'll add a few one-shot sound effects to flesh out the arrangement. Grab Fx_01.wav from the samples folder, and place it at the start. We'll also take Fx_05.wav from the same folder. Place the effect on the last four bars, then reverse it to turn it into a fantastic riser. A final effect (Robo_FX_01.wav) placed on the second eight bars adds extra detail.



8 > Turn down the effect channels to -18dB, so they are pushed back in the mix. Copy the drums and effects across to the previous 16 bars, so we can use them to build the intro. Mute the kick during the intro's first eight bars, and the percussion for the second eight-bar part. Duplicate the clap so it plays over the kick, before doubling up for the last four bars.

9 > Let's add some musical elements to the intro, starting with brass. Grab the OT_Lp-Brass-E3.wav sample and duplicate it across the intro. Turn it down to -6dB. Next, we'll make an intro riff from the bass notes. Add Dmitry Sches' ThornCM onto a new MIDI track, then duplicate the bass MIDI across. Use the LEAD Rush preset, as it complements our intro perfectly.



10 > We'll turn down ThornCM's channel to -7dB to retain a nice mix balance. Next, select the first bar of the brass and lead regions and copy them across the second eight bars of intro. This adds momentum to the build up, and we can embellish this even more by making the brass and lead loops repeat more quickly during the last four bars of intro, similar to a kick roll.

11 > Select the kick drums for the last two bars of the intro, then double them up. We'll double up the kick again for the last bar, creating a classic roll. Now, we'll high-pass filter the kick drum out before the drop using Vengeance VPS Philta CM. Add the plugin, and draw in some automation so that the kick's bass disappears before the drop, before snapping back in.

12 > To finish, we'll flesh the track out into a larger arrangement. Duplicate the 16-bar drop, then place the entire intro after it so we've got an intro, drop and breakdown. We'll then select the full drop, and copy it after the breakdown. We'll duplicate the last 16 bars of the second drop, then mute the mid bass so it's more of a cooled-off section to finish on.

> Step by step 2. Mid-bass synth using Dune CM

1 > Making a detuned, abrasive mid synth patch is a doddle with Synapse's fantastic Dune CM. Load the Init preset from Bank B to reset the synth. Set both Oscillator 1 and 2 to a square wave, for richer harmonics. Setting the OscMix to 50% brings Oscillator 2 into the mix.

2 > Beef up our sound by pushing Oscillator 1 and 2's Fat dials to 70%. Increasing the Ring Mod amount to about 60% adds a high pitched overtone. Now, when we adjust FM 2 to 66%, Oscillator 1 will modulate the frequency of Oscillator 2, resulting in a wobbly bass tone.

3 > Adding detuning will make our sound more abrasive. Set the Unison voices to 3, and Detune amount to around 80%. Tune Oscillator 2 up by three octaves, so the synth sounds more piercing. Set the Filter Env to 100%, so we can modulate the filter with the onboard filter envelope.

4 > Reduce the Filter Cutoff to 10%. Setting the Filter Envelope for a medium attack and decay, with fastest sustain and release, opens and closes the filter quickly when a note is played for that authentic bassline sound. To finish, increase the filter's Resonance to around 40% for a sharper sound.

> Step by step 3. Designer drops

1 > Let's add some individuality to our track using some clever plugin processing. Start by adding Vengeance's VPS Philta CM to the Lead Synth channel. We'll use the high-pass filter to gradually fade in the lead's low frequencies over the first eight bars of intro, for extra suspense.

2 > Add another VPS Philta CM to the Brass channel, so we can low-pass filter the brass out leading into the drop. Draw in the automation, so it takes a few of the high frequencies away for the first eight bars, with a more obvious fall in the second eight.

3 > Group the brass and lead parts. We'll use Subsonic Labs Wolfram CM on the group to process the musical parts together to lead into the drop. Load the CM Resonance Peak preset, then automate the Mix across the intro to gradually fade the effect in.

Arrangement hacks

When arranging, it's always good to go the extra mile and put your stamp on it. You can do this in lots of ways, including by using automation. For example, you could low-pass filter your drums during the intro so the high frequencies gradually fade in, adding a level of suspense. Another simple automation trick is to adjust the master volume so that it gradually reduces by 1dB just before the drop, before changing back to the original volume to give the drop a greater bit of impact.

Creating clever edits to parts of the arrangement can also add individuality. One of bassline's most common edits is the false drop, whereby the drums will be muted for the first two bars of the drop in order to make the bassline the focal point after the buildup. It's also worth doing some subtle edits to your drums, either by adding extra parts that come in during the track or by making pattern changes at the end of a phrase.

> Step by step

4. Bassline mixdown

1 > Let's begin by processing the sound effects we've used, so they work with the other parts more effectively. Start by grouping the three effects. Call up DDMF's LP10CM EQ, and set Band 1 to HP12. Setting the filter Frequency to 200Hz will roll off the low frequencies, adding clarity.

2 > Synthesised sound effects of this type often sound sharp in the high mids, thanks to the resonant filters and noise used to create them. We'll deal with this using ToneBooster's SibilanceCM; this is designed for vocal duties, but it helps control high frequencies in any sound.

3 > Let's turn our attention to the drums. Group all the parts, except the kick. Load up Eareckon's CM-EQUA 87 onto the group, and set the high-pass Filter to 150Hz. This'll make room for the kick to breathe. A 2dB HF shelf boost at 8kHz adds shine to the drums.

4 > Let's process the snare. First, set the channel time delay to 5ms, so the snare is delayed behind the grid to aid layering with the clap. Next, add Audiority's TS-1CM transient shaper. Set Gain A to 24, and Blend to 100% to remove the 80s sounding reverb from the snare.

5 > Group the clap and snare, so we can process them as one. Add Rob Papen's RP Distort to the group, then select the Mackie CH Dist RF preset; this emulates a retro Mackie mixing board. Reduce the dry/wet to 3% wet, so our distortion is mixed into the dry signal.

6 > To finish, we'll process the mid basses. Group them, and add Sonimus Satson CM. Set the high-pass filter to 9 o'clock, so it rolls off the low frequencies. Switch in the 12dB/oct filter, so it makes a sharper cut. Push the Gain to 1 o'clock to add drive.

Synth work

Sound design, and in particular bass synthesis, is a big part of the bassline aesthetic. Whilst you can use sampled basses to great effect, making your own patches using a synth will allow you to adjust the synth's tone as the track unfolds, creating interesting variations on your original sound.

As the sounds in bassline are very dense and detuned, it makes sense to use a wavetable synth with multiple oscillators as your starting point. Wavetable oscillators generally offer more harmonically dense waveforms, which can be combined together to create the attention-grabbing, complex tones we're after.

If you're still struggling for inspiration, you can always take signature sounds from other genres, such as 808 sub hits, jump up DnB bass hits or rave hoovers, and work them into the track alongside your own synth patches, either to use as the main bassline or as stabs.

Xfer's Serum is a great wavetable synth to use for sound design in genres like bassline

Using these kinds of sounds can give a timeless feel to your track, alongside an element of familiarity too.

POWER TIP

>Reining it in

You'll normally find that the detuned synth parts used in bassline have quite wild resonances between 300Hz and 2kHz or so, which is what gives them their unique character. The usual approach to these kind of issues is to reduce the resonant frequencies using EQ notches or multiband compression, but you might find that this can stop the synths cutting through correctly on a PA system. Instead, try and make room for these frequencies by making EQ cuts to the parts that sit in a similar frequency, such as pads, vocals or percussion.

The 6 best...

Softsynths... of all time!

Softsynths are the latest electronic music tools. Here are *Computer Music* magazine's top 6 all-time picks...

Spectrasonics Omnisphere

£339

"If being at the cutting edge of sound design appears on your list of music production priorities, it's an instrument that you simply have to own," **cm** said in their review of Omnisphere. Since then, every sound designer – and everyone else, for that matter – has hailed this as the ultimate in synths. Take whatever audio you want, plus a huge amount of great quality supplied material, and mangle it through the best engine in the biz. If there was a 'top synth' spot, this might well be on it.

spectrasonics.net

XFer Records Serum

$189

Where every sound designer says (over and over again) that they favour Omnisphere over all other synths, so every dance music producer says they favour Serum. It has so many incredible component parts – oscillators, wavetable engine, effects, modulation and much more – that the end result could not fail to be disappointing, and it sounds incredible. "The most sonically versatile synth we've ever used, and certainly one of the best-sounding."

xferrecords.com

u-he Diva

€179

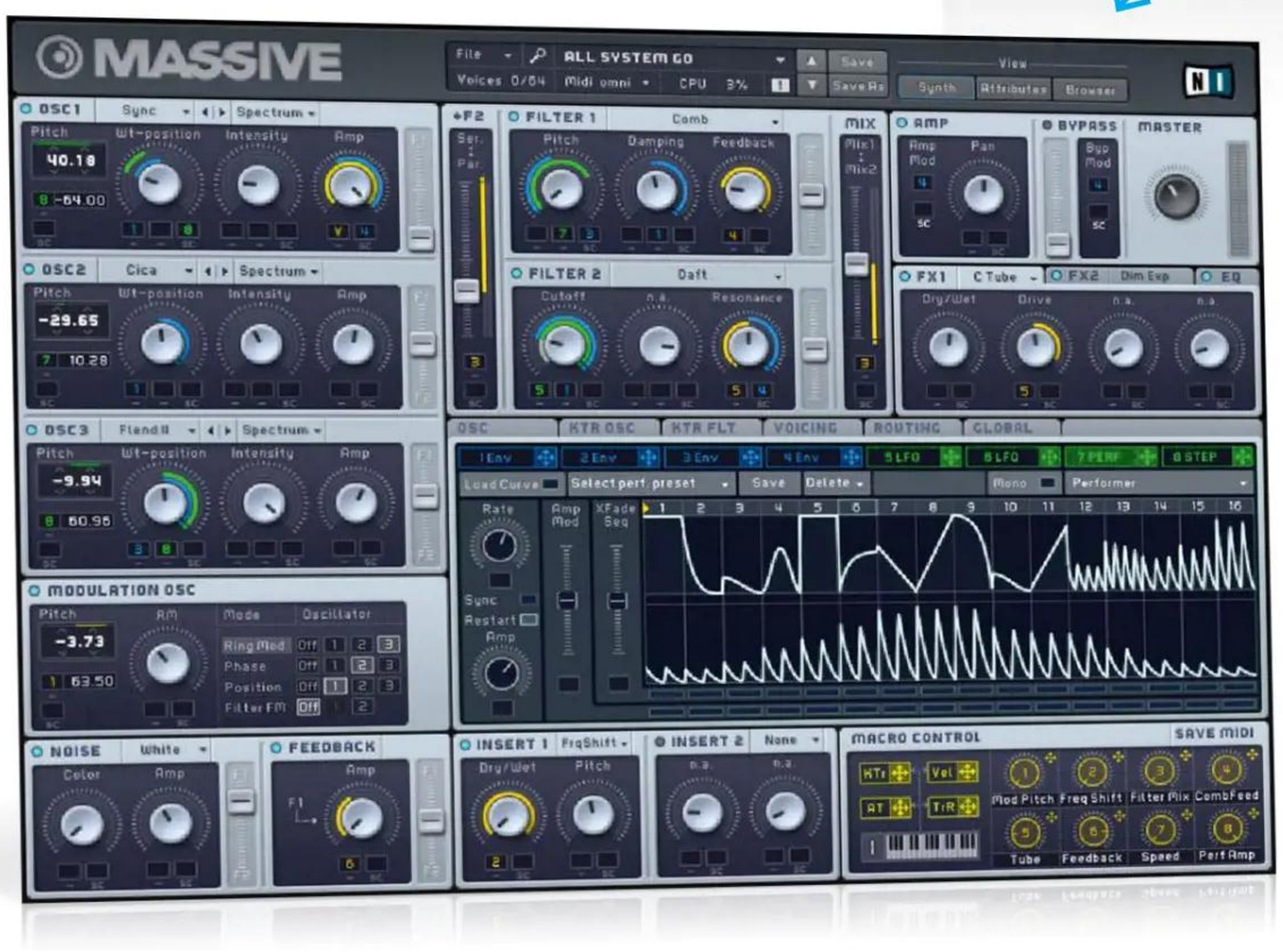
There are many (many) virtual analogue synths we could have included in this top 6, and many of those emulations of hardware classics. Instead, we've included possibly *the* greatest virtual analogue synth ever, as it provides parts of many a classic synth to become a classic softsynth in its own right! And Diva means 'Dinosaur Impersonating Virtual Analogue'. What more could you ask?

u-he.com

KV331 Synthmaster
from $99

The multi-award-winning softsynth-to-end-all-softsynths offers pretty much any synthesis type you can think of (including VA, Additive, Wavetable, PM, FM, PWM, RM, AM and more) yet, incredibly, a pretty damn easy interface to control everything. And it sounds incredible: from deep basses and searing leads, to dynamic pads and emotive atmospheres. Quite simply, it is "one of the very finest softsynths money can buy."

kv331audio.com



Native Instruments Massive
£129

The fact that the original *Computer Music* review of Massive was published in 2006 and that Massive is still popular says it all, really. With its morphing wavetable engine, it was and still is capable of producing incredibly dynamic sounds that have become the backbone to many a cutting-edge track. A classic, pure and simple.

native-instruments.com

LennarDigital Sylenth1
€167

Never judge a synth by its presets, is probably some way-too-sensible advice when it comes to softsynths... unless it's Sylenth 1. 30 seconds after dialling in the first sound and you will be drawn in for hours. The best 303s, the best thumping basses, the best tearing leads and all behind an unassuming, easy interface. "LennarDigital surely have one of the underground releases of the year on their hands," **cm** said in 2007. Next 14 years actually...

lennardigital.com

SYNTHWAVE

As modern as a neon sign illuminating the brushed steel hull of a DeLorean, synthwave is aglow with 80s artificiality. Here's how to surf the synth wave...

> *Everything old is new again*. Just this once, it's appropriate to begin with a cliché. After all, synthwave as a genre is all about clichés snatched from PG-13 movie posters circa 1985.

As a consciously-considered (contrived?) genre, synthwave has only been around since the mid-2000s, but the music that inspired it has been around for 40 years. Created and consumed by a generation weened on equal parts *Blade Runner*, *Battle Zone* and *Back to the Future*, synthwave owes everything to the aesthetic of the 80s.

So what is it? You've got it etched into your memory – the pulsing synth basses of a John Carpenter movie or Michael Boddicker's gloriously goofy end titles for *Buckaroo Banzai* – not to mention the low-rent electronic scores to dozens of straight-to-VHS sci-fi flicks.

Game composers like Chris Huelsbeck composed mini-epics for many an after-school afternoon, as kids hunkered down with their Commodore 64 or Amiga 500. Many of those kids would themselves become musicians, bringing their influences into the modern era.

Thanks to the current proliferation of cheap gear and an industry obsessed with all things vintage, synthwave seems... inevitable.

In this workshop we show you how to compose a 21st century synthwave track using the **cm** Plugin Suite and samples that you can find at filesilo.co.uk (at Bookazines/ Music Producer's Guide To Electronic).

>Step by step

1. Building the backing tracks

1 > The artists who created the music that inspired synthwave faced the limitations of the day – expensive gear with low polyphony and poor sync options, limited track counts and fidelity. Happily, we can make use of **cm** plugins to provide our sounds and compose, record, and mix our project in a free DAW such as Tracktion Waveform Free.

2 > Here, we've created a new project with the default eight tracks. (We can add more.) We'll start with that staple of the 80s, the arpeggiator. For this, we'll bring in an instance of Dune CM. In Waveform, this is done by dragging the grey "+" widget down to the right-most section of the track. A menu tree appears, from which you can select the plugin.

3 > Dune CM might seem modern – and it is – but it's got a nifty arpeggiator that suits our needs. Look to the display, find where it says Category and click Show All. Select the Arpeggiated category. This filters all but the arpeggiated patches. To the right, you see arrows for selecting the desired patch. Click the right arrow until you get to Dance Lead.

4 > Judging from the patch name, this too seems a modern choice. However, once you sustain a note, you'll understand – it seems straight out of *Blade Runner*! Let's insert a MIDI clip. In Waveform, this is accomplished by selecting the area in the ruler with the blue flags and then dragging the red '+' down into it. Your clip should stretch across eight bars.

5 > You'll be met with a few options, one of which is to Insert New MIDI Clip. The clip will then appear. Double-click your clip's header to open up the piano roll. Use the arrows at the top and bottom of the Keyboard on the right to home in on the octave above C2. Next, use the Pencil tool to draw in some long notes. We're using A2, G2, A2, and C3.

6 > Sounds good! Let's name our track Dune CM Arps. We'll add a kick drum. Currently, our full eight bars are still bracketed in the ruler up top. Move the right-most bracket to bar 3. Create a new two-bar MIDI clip on Track 2. Next, instantiate Xils Lab StIX CM on that track. Use the Load Kit browser in the upper-right to load Rock Mainstream LtZ.

SYNTHWAVE OLD AND NEW

JOHN CARPENTER, TOMMY LEE WALLACE
ASSAULT ON PRECINCT 13
A high point among Carpenter's many brilliant self-composed movie scores.

bit.ly/jctlw_aop13

MARK SHREEVE
LEGION
Perfectly encapsulates all that would become synthwave a full two decades later: thumping drum machines, primitive digital synths, all at a breakneck pace.

bit.ly/ms_lgn

MICHAEL BODDICKER
BUCKAROO BANZAI (THEME)
The whistling leads, synth brass fanfares, and analogue effects come together in a jaunty, joyful theme. A euphoric anthem.

bit.ly/mb_bckrbnz

TECH NOIR
GUNSHIP
The title tells you what to expect with this one. Simmons drums and dense analogue polysynth chords set the mood for a modern take on the Old Wave.

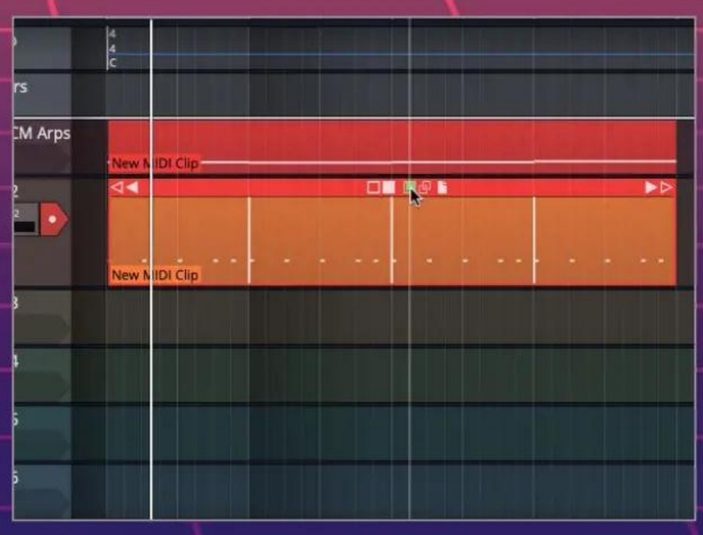
bit.ly/tn_gnshp

PRO TIPS

ESCAPE VELOCITY
Some of the relentless power of those old soundtrack tunes most assuredly comes from the fact that they never seem to let up – the beats are powerful, relentless rather than subtle or dynamic. Everything seems as if it was cranked full – and it probably was. In those days, velocity sensitivity was a rarity. Even expensive classics like the Oberheim DMX drum machine didn't offer dynamics. Try eliminating velocity modulation for a more authentic sound.

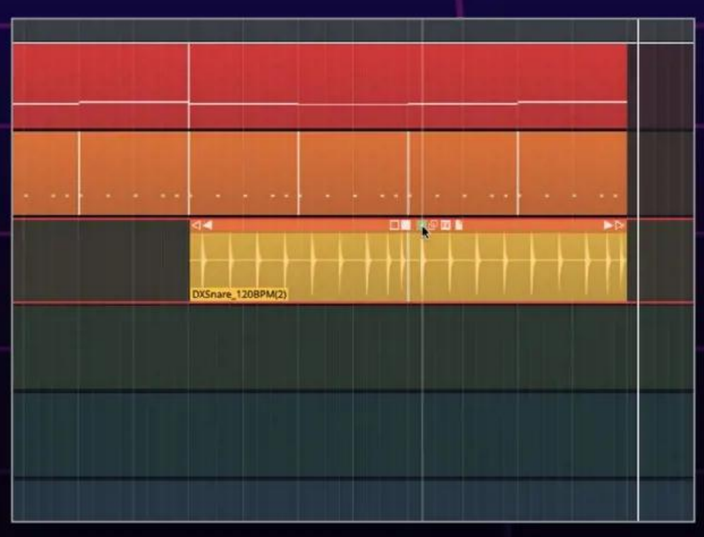
VIDEO STAR
Synthwave fans find much to love in boxes of dusty, thrift store VHS tapes. As a tape-based medium (albeit a digital one), they were prone to failure, with poor tracking, garbled audio, and all manner of glitching. If you have a dilapidated video recorder tucked away in an attic, consider using it as a processor of sorts. Record samples and play them back into your DAW or even try mixing a song to VHS!

7 > This kit has a pretty good kick drum. Let's use StIX CM's effects for lo-fi grit. Go down to the lower-middle section and the Disto/Crush effects. Activate them. Now, dial the BITS to 10 and then crank the S. Freq (for Sampling Frequency) down to 12500.00. This will simulate the lower fidelity of classic drum machines like the Linn LM-1 and Oberheim DMX.



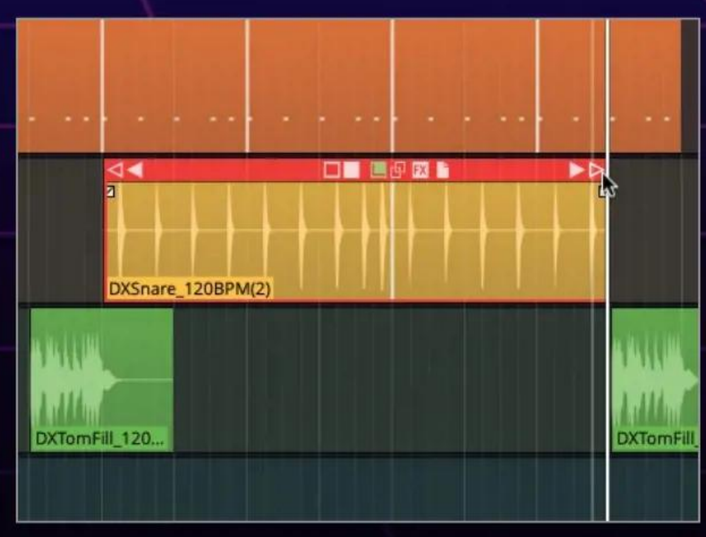
8 > Next, open your MIDI Clip for editing and enter a very few kick drum beats. We want it slow and steady for the intro, so bar 1, beat 1, bar 1, beat 3 and so on. We've added an extra at bar 2, beat 4. We want to loop this clip to play over the entirety of our eight bar arpeggiator pattern. In Waveform, looping is activated by clicking the L button in the clip header.

9 > In our kick drum, we created a passable imitation of a 1980s kick drum, but authentic retro drum sounds are crucial to creating a proper synthwave beat. The drum sounds of the early-80s were defined by sample-based drum machines like the Oberheim DMX and its sibling, the DX. We've hauled out the real deal for a snare loop and a tom-tom fill.



10 > Let's extend our existing clips for a full 16 bars. In Waveform Free, you can loop your MIDI clip in the same way you did your kick drum audio clip. We'll dedicate Track 3 to our Oberheim DX snare sound. It's called DXSnare_120BPM.WAV; find it among the tutorial files at filesilo.co.uk. It should start at bar 9, beat 1, and loop for eight bars.

11 > Next, put those awesome Oberheim toms into play. Few sounds better evoke 80s nostalgia than gritty, 8-bit tom-toms. We've provided a rapid, zero-velocity fill of the sort that punctuated many an 80s TV program. The file is called DXTomFill_120 BPM and it, too, can be found among the tutorials files. Bring it in to your project, beginning at bar 8, beat 1.



12 > Our toms provide a nice transition for the entrance of our snare drums. We'll have another change at bar 17, beat 1, so copy your tom-tom fill and paste another copy in starting at bar 16, beat 1. You can use the snare loop's clip handles to excise the bits that overlap with the tom-toms just before the end of bar 16. Our track is shaping up nicely!

Know your limits

Our modern computer-based DAWs offer virtually unlimited power and flexibility. We can pile on as many tracks as we like, route them through a staggering number of effects processors, and chop, tweak and automate every squeak, sputter and peep we've recorded. We can nudge our vocals into perfect tune, simulate choirs and automate every parameter with pinpoint accuracy. Perfection and excess are no longer unattainable, but kind of expected.

This, however, is not the path to retro enlightenment. In olden times, songs were recorded to a limited number of tape tracks and automation was all but unheard of. Multiple tracks were often routed to a single effect – not the other way around. Even the finest studios would offer artists a finite number of compressors, reverbs, delays, and EQs. If a performer made a mistake, the performance would have to be attempted again – often in its entirety.

The wise synthwave artist exploits modern technology, but is never seduced by its excesses. Limit your track counts, effects processors, and perhaps even the number of synths and samplers you have in play.

> Step by step 2. Fleshing out the project

1 > Let's extend the Dune CM arpeggiator loop and snare clips out to bar 25. We've got the basic beat down for what will be our intro, but we could add some energy with a slightly busier kick drum, so let's add another MIDI clip on Track 2, at bar 17, beat 1. We'll go ahead and loop this new clip over eight bars.

2 > We could also use a hi-hat, so drop an instance of StIX CM onto Track 5, going to Load Kit, finding the Dance Floor category and calling up the drum kit named WA TR-909. Next, create an eight bar MIDI clip with three eighth notes at the start of each bar.

3 > For an authentic retro pad, we will look to u-he's Zebra CM, which can be instantiated on Track 6. Having done so, we'll call up the preset from rsmus7 called SM Stringer and lay down a simple progression consisting of just root notes of our arpeggiated passage on Track 1.

4 > Bring in a second instance of Dune CM on Track 7. Go to the Bass preset category and find the patch called Hardcastle Bass RL. Once again, this might seem a little anachronistic, but the sound will work for us. Create a clip with some rapid fire, octave jumping notes.

> Step by step 3. Additions and embellishments

1 > Call up an instance of Alpha CM on Track 8, and find the preset patch called BRS-Classic-TEG. Record an eight-bar clip at bar 17, consisting of root notes and perfect fifths (remembering that our arpeggiator track modulates from key to key). It might be easiest to mute a couple of tracks while recording.

2 > We'll need a raucous lead sound that can cut through our dense mix, so create a new track and drag an instance of Zebra CM in. Find the preset patch called TUC Fat PolyKeys (VST). This is a cutting, brassy sound. Perfect! Jam out a simple lead or copy the one shown here.

3 > An old-school handclap wouldn't go amiss, so stick another instance of StIX CM on a new track, and dial up the preset kit called WA TR 808. Go ahead and record or draw in a few bars with a handclap on the backbeat. You might consider creating a fill clip, too.

> Step by step 4. Arranging, mixing and effects

1 > It's time to take a step back and consider our arrangement. Zoom out to take in all of the various bits that make up your track. Let's collect the like tracks together – drums all at the top, followed by arpeggiator tracks, followed by pads and then the lead. Unmute any muted tracks.

2 > Move your clips about, copy them, paste them and loop them until you have a nice build-up of the various parts. Here, we've got a slow build, a respite, and then a climactic end section with our lead in place. We've also added another slightly busier hi-hat clip at bar 57.

3 > It's a pretty good arrangement, and our sounds are suitably retro. The snare might need a touch of 1980-era processing, though. Solo and loop the track. Let's grab an instance of Acon Digital's CM Verb and put it directly on our snare's track. The Medium Hall preset will suit our needs rather nicely.

4 > You probably know what's coming next! Yep, we're going to strap a gate plugin across the reverb. We'll use Unfiltered Audio's G8 CM. The various parameters need to be set carefully to avoid stuttering, paying careful attention to both the Threshold level and the Hold time for a perfect gated 'verb sound.

5 > Let's start working on our mix. We'll begin by setting up the loop markers to cycle the busiest parts of the track. We'll then pull all of our faders down to nil. Bring the levels in one at a time starting with the kick drum, snare and arpeggiator tracks. Give yourself plenty of headroom.

6 > Once you've got your relative levels set close to where you'd like 'em, go ahead and start tweaking the pan positions of the drum tracks. Just a bit, don't get crazy! You can, of course, go much further than we have here, so don't be afraid to experiment with more **cm** instruments and effects.

De-rez

Given the subject title, you'd be forgiven for thinking we're going to talk about *Tron*. Nope. Instead we need to discuss yet another aspect of modern technology that might best be avoided if we're going to go full-on retro. The subject up for consideration is audio fidelity. In the days when laser discs and Walkmen roamed the Earth, sampling was in its infancy. Early samplers were breathtakingly expensive and offered bit depths and sample resolution that seems laughable by today's standards. For instance, the original Emulator offered eight voices of 8-bit, 21kHz sampling for £8,050. Yeah.

Nevertheless, this was the sort of equipment used to create chart-topping hits and blockbuster movie soundtracks. Because

The E-mu Systems Emulator: lots of cash back in the day

RAM was costly, samplers of that era offered limited sample time. If the composer ever wanted more sample time, the available sample rate might be dropped down, further reducing fidelity.

Nearly every modern sampler or DAW offers some manner of bit-crushing, allowing you to impart some of that vintage vibe to your drum hits and dialogue samples.

POWER TIP

> Chomping at the bit

We've already discussed the limitations of the ancient samplers and you already know you can apply a bit crusher to your sounds for some retro grit. However, you might consider going a step further by calling upon the real deal. No, we're not suggesting you splash out for some overpriced collector's item! Instead, consider scouring the local thrift stores and boot sales for a cheap toy sampler such as those made by Casio or Yamaha. They're cheap, easy to use, and can add loads of exaggerated lo-fi character to your sounds.

TAKE YOUR ARRANGEMENTS TO THE NEXT LEVEL

We've cherry-picked the finest tutorial features from the pages of Computer Music and Future Music – each guide created specifically for the computer-based producer – to bring you this compendium of music theory knowledge.

FUTURE

Ordering is easy. Go online at:

magazinesdirect.com

Or get it from selected supermarkets & newsagents

Classic Gear

Over the next dozen pages, we look at some of the classic hardware synths that have shaped the sound of Electronic Music over the last five decades. Many of them have become so collectable that they now command almost extortionate second-hand prices. With this in mind, for each of our classics we also offer three more cost-effective alternatives, including software plugins available for Mac or PC and, where possible, iOS emulations...

118 Moog Modular
The modular synth from the company that started it all

119 ARP 2600
Another US classic synth, and one of the first more 'manageable' synths

120 Moog Minimoog
The synth that launched a thousand Kraftwerks (and emulation plugins!)

121 ARP Odyssey
ARP's answer to the Minimoog was (and is) a screaming synthetic delight

122 Yamaha CS-80
Yamaha's incredible CS-80 is most widely regarded as the best synth ever (and by some as scoring the best film ever)

123 Sequential Circuits Prophet-5
One of the best polysynths of its time is now – like other synths in this roundup – being produced again

124 Fairlight CMI
Not so much a synth but a full sampling workstation, this brought the processing of audio to, well, just the rich few actually

125 Roland Jupiter-8
Probably Roland's finest ever synth, and one of the best polysynths ever produced

126 Roland SH-101
Another classic Roland, this one is a great mono, and one you can actually wear!

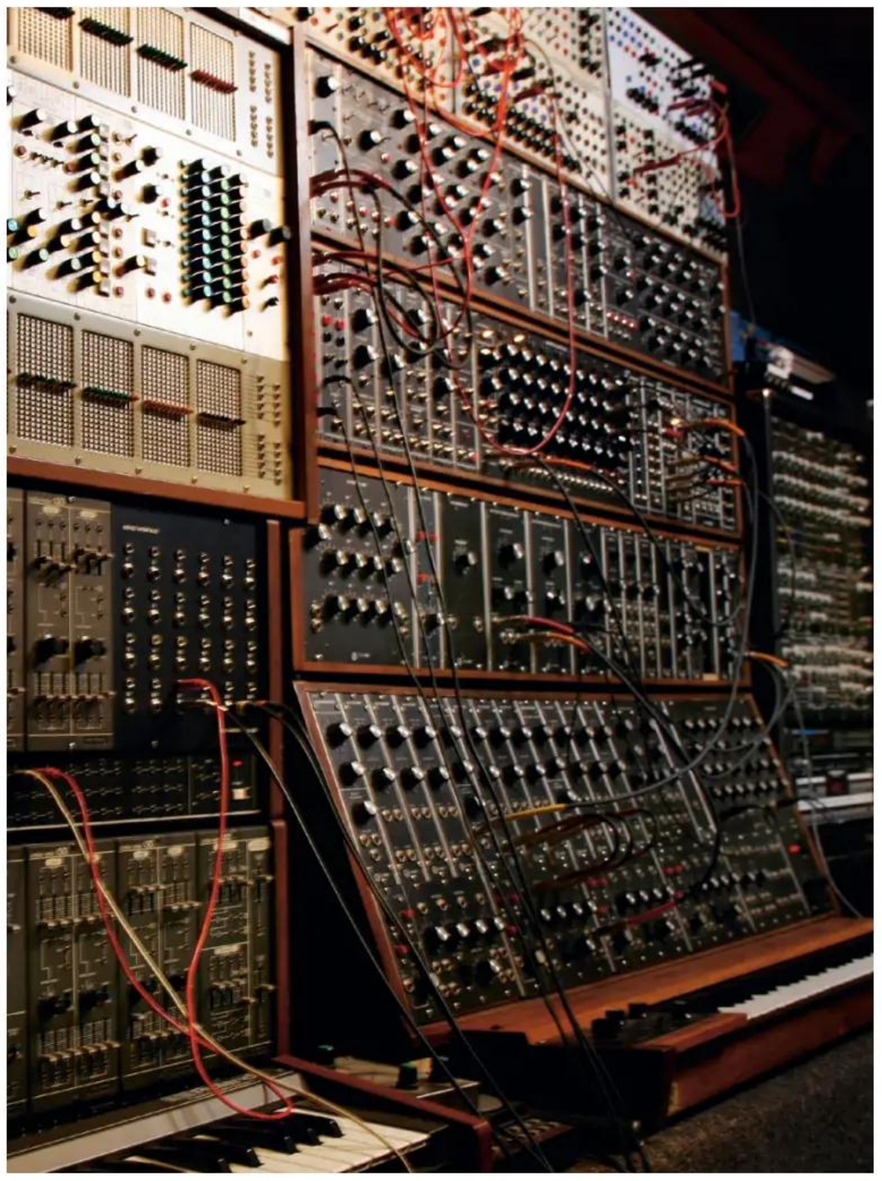
127 Yamaha DX7
One of just two purely digital synths in this roundup, the DX7 shifted millions but was only mastered by one (or indeed, Eno)

128 Roland Juno-106
The third Roland on our roundup is from the company's glorious Juno range

129 Korg M1
Another digital synth that shifted by the million, the M1 also launched a genre or two

Moog Modular

What better way to introduce our Classic Gear section in this Electronic Music guide than with the synth that started it all: the Moog Modular?



> Robert Moog didn't create the first synthesiser; nor was his modular system the only game in town when it was unleashed on the public back in 1964. Yet it was Moog's Modular system that would become associated with synthesisers in the public mind. Why? Well, for a start, Moog's instrument – as complicated as it was – was designed to be used by musicians.

Simply put, Moog listened. When Vladimir Ussachevsky proposed the four-stage ADSR envelope, Moog listened; when Wendy Carlos offered up suggestions on how to improve performance, Moog listened. In fact, the entire endeavour was kickstarted when Moog met composer Herbert Deutsch in 1963. It was Deutsch who suggested using a simple organ-style keyboard to control the instrument. This single addition gave this mind-bogglingly complex Moog system something with which any musician could identify: it made it clear that this was a musical instrument, despite the fact that it looked like something out of a mad scientist's laboratory.

Additionally, many of Moog's design flourishes have become standards. His use of voltage control and the introduction of the volts-per-octave pitch control are now predominant in analogue synth design. Voltage control allows one to modulate parameters like filter frequency or pitch from various sources, such as an LFO or envelope generator – a method of sound design that still informs the way synthesisers are made.

Moog's system consisted of around 70 modules, housed in walnut cabinets or Tolex-covered portable cabinets. Modules were connected with patch cables. There were (initially unstable) oscillators, sequencers, envelope generators and amplifiers, mixers and that now-ubiquitous 24dB low-pass filter. If any feature defines the 'Moog sound', it's that filter, with its zippy resonance and ability to self-oscillate – it's unmistakable and, seemingly, quite difficult to emulate precisely.

Needless to say, the 'Moog sound' has been something of a holy grail to soft synth developers, some of whom have been more successful than others in capturing that elusive character. Those wishing to recreate the experience of using a Moog Modular system can turn to the many hardware modular systems currently on the market or even to software modular synths. Some recreate the experience in full, with dangling patch cables and pixel-perfect faux wood cabinetry; others take the idea into the modern age, with deep modular environments that bear more resemblance to programming languages.

Most of us will have to settle for the copies. Moog's Modular systems have become highly prized collectors' items, with even small systems selling for astronomical prices. However, Moog did start manufacturing the Modular again, the IIIp being the new incarnation, yet only 40 were built at a price of $30k plus. If you're lucky enough to be able to afford one, or the original, you'll be getting a piece of musical history. Previous owners include Tangerine Dream, Klaus Schulze, The Beatles and The Stones.

TECH SPECS

Year of manufacture
1964 – 1981

Original sale value
Systems: $2000 - $10,000
Modules: $100 - $1300

Number made
Unknown

Three great emulations

ARTURIA MODULAR V
€149

This one will get you as close as possible to the experience of using the original, with its dead-on interface and full complement of modules patterned after the real thing. Initially, the Modular V was blessed by Dr Robert Moog himself, and the famous Moog logo took pride of place on the GUI. The sequencer module is particularly nice.
arturia.com

OGO KARMAFX SYNTH
€76

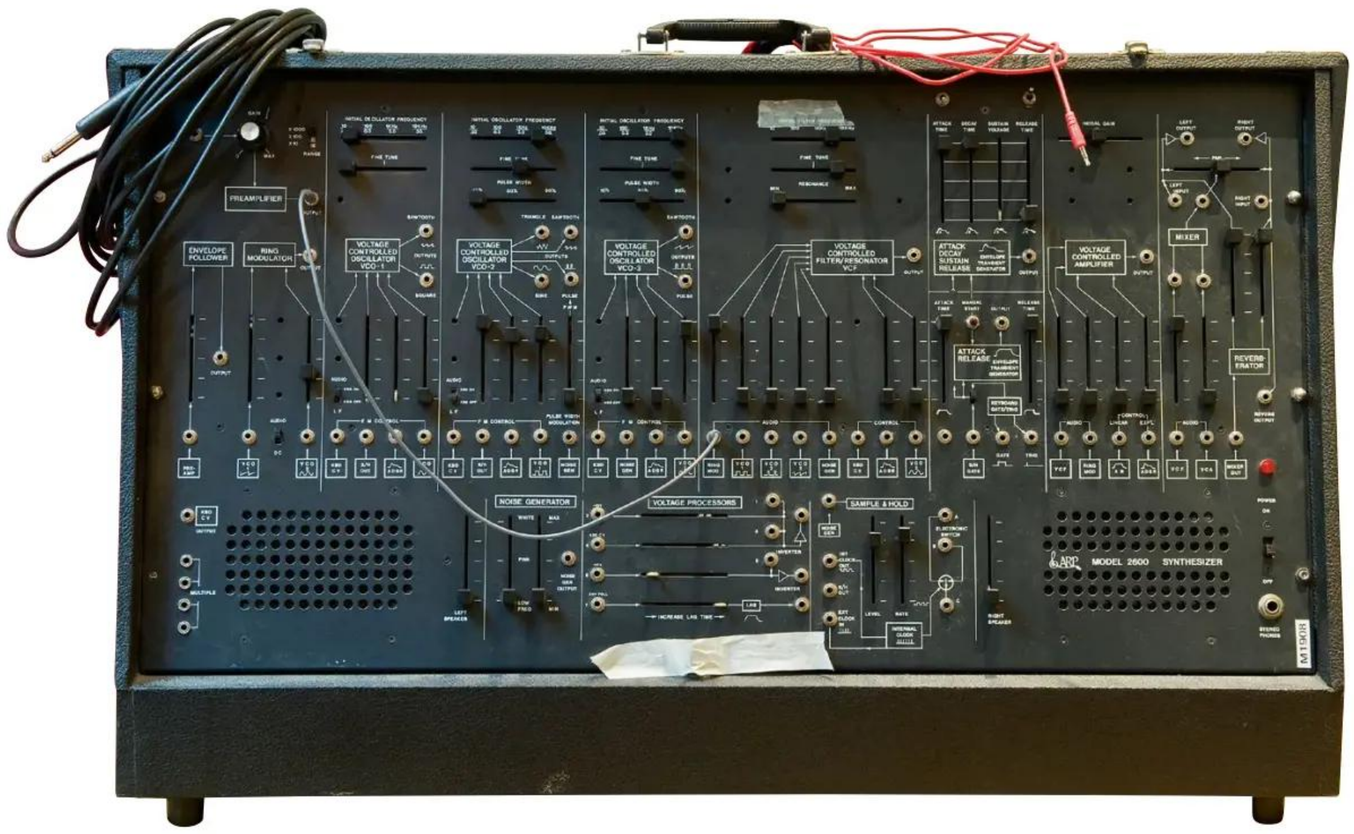
Not an emulation of the Moog system, nor a graphical language-style modular, this one lies somewhere in between, with a comprehensive collection of modules including a terrific filter with Moog-style low-pass mode. Virtual patch cables are used but don't obscure the modules' controls. An excellent tool for education and creativity.
karmafx.net

MOOG MODULAR 15
£29.99

Moog might well have reintroduced the Modular in hardware form, but it's still mighty rare and way too expensive for most, so why not try this 30-quid app instead? It's been developed by Moog and is one of the best Modular experiences you can have with any device, with many great presets, effects and fantastic touch routing.
moog.com

ARP 2600

Released alongside the Minimoog and EMS' VCS3, the ARP 2600 offered portability, patchability and something the competition simply couldn't match



> Named after founder Alan R Pearlman, ARP was the 'other' big name in American synthesisers in the hurly-burly early years of commercial synths. Founded not by an enthusiast but an entrepreneur, ARP instruments were designed from the start to batter (and better) the already-shaky reputations of the instruments from rival companies, stealing away much of their sales through shrewd (and sometimes unseemly) business practices.

Prior to 1970, synthesisers were expensive, expansive modular behemoths better suited to studios or the halls of academia. Such a customer base was necessarily limited, and the major players knew that the survival of the fledgling synth market depended on getting this new technology into the hands of performing musicians. Few musos were willing to drag a modular monster onto the tour circuit.

ARP attack

Making its initial splash at the AES convention held in the Autumn of 1970, the 2600 was – like Moog's new Minimoog and EMS' VCS3, both debuting at the same show – meant to usher in an era of portability. All three offered stripped-down, simplified versions of much larger modular systems (the ARP 2500, Moog's legendary Modular systems and EMS' main-man Peter Zinovieff's own personal electronic music studio). Each manufacturer took a different approach to the question of patching on their new portable powerhouses. EMS used a pin matrix to make patch connections, while Moog eschewed patchability entirely for a fixed signal path. The 2600 came down in the middle: there was a fixed path under the hood, but the signal could be rerouted by plugging cables into the vast array of 1/8" jacks that peppered the instrument's front panel.

Like the other soon-to-be-classics on show, the 2600 offered three oscillators with various typical waveforms on tap. There was a distinct difference here, though, in that the 2600's oscillators were relatively stable in pitch – something that Moog and EMS simply couldn't match. ARP knew this, and its advertisements took pot shots at the competition. The new ARP instrument trumped the competition in other ways, too. For instance, though all three debuting synths provided noise generators, the 2600 offered sample-and-hold circuitry, making it terrific for space-age bleeps and bloops.

With both ADSR and AR envelopes and a built-in reverb tank, the 2600 was beautifully outfitted, even by today's standards. Its oscillators were rich and precise, while its filter could hold its own with Moog's famous 24dB model – and for good reason, as it turned out, for the ARP 4012 filter design was pretty much a 1:1 copy! Moog got wind of the similarity and soon put a stop to it. Later, the 2600 would sport a different filter, adding yet another variable to please and perturb modern collectors.

TECH SPECS

Year of manufacture
1970 - 1981
Original sale value
£1350
Current price
£4000 - £6500
Number made
Approximately 3000

Synthetic history

Everything that made the 2600 a brilliant instrument in 1970 stands today: good sound, comprehensive features, and flexibility that educates rather than overwhelms. Relatively few were made, and with secondhand unit prices sky high, it was only a matter of time before new hardware recreations surfaced, and you can now buy Korg and Behringer models.

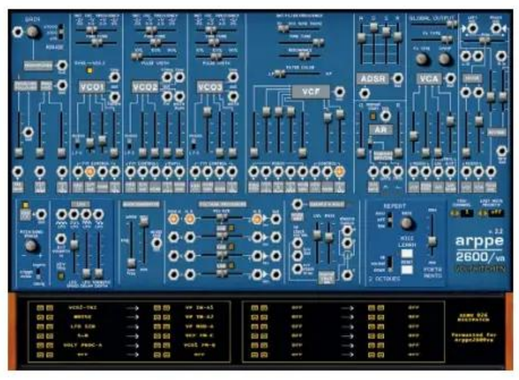
Three great emulations

ARTURIA ARP 2600V
€149

Featuring a closely-modeled recreation of the original 2600, along with a choice of GUIs to match each change in the appearance of the hardware, Arturia throw in a model of the modular ARP 2500 filter, chorus and delay, and an emulation of the 1601 sequencer, along with all of the other perks of virtual synths.
arturia.com

WAY OUT WARE TIMEWARP 2600
$99

How close to the original do you need a plugin to be? When we first heard Way Out Ware's dead-on Mac/PC emulation, we were a little put off by the basic, raw sound of the factory presets. Yet it can't be denied that this is exactly what you'd get if you'd shelled out for the real hardware. It's a great emulation and now at a much more reasonable price.
wayoutware.com



VOLTKITCHEN ARPPE2600VA
FREE

Dispensing with virtual cables, this recreation of the awesome ARP makes use of a drop-down modulation matrix to perform all of its routing duties. It allows for the creation of precisely the sort of weird, modulated effects that made the original a favourite among sound designers. Available only to Windows users in 32-bit.
glenstegner.com/softsynths.html

Moog Minimoog

Your plugins folder is probably filled with synths that owe their design to this classic that impacted both music and our understanding of synthesis

> Moog. At one time, the name was quite literally synonymous with 'synthesiser'. Moog (rhymes with vogue) was among the first on the scene with purpose-built synthesis modules.

Its modular synthesisers appeared on albums by artists ranging from The Beatles to The Monkees and, of course, Wendy Carlos' groundbreaking *Switched On Bach*. Yet the cost and complexity reserved the luxury of synthesis for universities, studios and the wealthiest musicians. Had it not been for a simple, seemingly obvious innovation, the Moog sound might have been little more than a cultural curiosity of a bygone era, not the seminal sonic signature that resonates even 50 years later.

Mother of invention

That innovation was the Minimoog. Initially cobbled together from individual modules and parts scavenged from the junk bin, this instrument saw patch cables give way to a fixed, hard-wired signal path and, after a few iterations, this flight of fancy took the familiar form of the Minimoog Model D.

The Minimoog turned the industry on its ear. Not overnight, mind – sales were difficult. There was no precedent for this sort of instrument, and music retailers had no idea what to do with it. However, thanks to the efforts of Moog's David Van Koevering, the Mini slowly began to make its way into the hands of enterprising musicians longing for something new. It was really they who sold the Mini to the masses with innovative performances and recordings. Rockers like Keith Emerson, Rick Wakeman and Gary Wright paved the way before passing the baton to Gary Numan, who turned a new generation onto the 'Moog Sound'.

Sonic legend

The sound comes courtesy of a trio of versatile (if initially unstable) oscillators and that famous 24dB resonant filter, along with just enough controls to wrangle out interesting sounds time and again without being overwhelmed by a sea of knobs and jargon. There's noise, yes, but no sample-and-hold circuit. Envelopes are simple three-stage affairs. There is portamento and an audio input around back – mostly used to feed the instrument's signal back into itself.

Yet this is more than enough, thanks to the instrument's full, lively sound. The defining 'fat' bass, screaming leads and swooping effects have drawn in synth aficionados and software developers alike, the latter fuelled by the demands of the former to create a spot-on emulation – actually an impossible task, given that no two Minis sound exactly alike.

The synth's clear and easy-to-follow layout – oscillators on the left, mixer then filter to the right and envelopes below – has also become an industry standard. A simple, even elegant design, the influence of the Minimoog's signal path, front panel layout and left-handed control wheels can be seen on nearly every synth since. Moog has started remaking the Model D although it too has become rare. Grab one if you can find it, and you'll have a true synth classic.

TECH SPECS

Years produced
1970 - 1981
Number produced
12,000+
Original sale value
$1495
Current price
$6000 - $9500 (early models)

Three great emulations

GFORCE MINIMONSTA
£120

Winning over analogue enthusiasts takes some doing, but this one convinced even Rick Wakeman himself. GForce didn't just recreate the character of the Minimoog, but a very specific Minimoog with quirks and qualities, resulting in an instrument that is as eminently playable as the original. Simply gorgeous, as are the company's other emulations
gforcesoftware.com

MOOG MODEL D APP
£9.99

As with the Modular, Moog have not only restarted manufacturing the original hardware, they've also produced an app for us mere mortals. This one, as Moog say, "incorporates a number of inspiring sound creation tools and capabilities not present on its analog antecedent", those including 4-note polyphony and an arpeggiator.
moog.com

ARTURIA iMINI APP
£9.99

After earning Bob Moog's endorsement for their desktop plugin emulations of Moogs both Modular and Mini, Arturia pared some surface features from their Model D clone and produced this app, one of the first synths for iOS devices when it was released. Moog's own version eclipses it somewhat, but if you can get it cheaper than a tenner, it's worth a punt..
arturia.com

ARP Odyssey

It's alive! ARP's answer to the Minimoog refuses to be consigned to the history books, revived for the modern age in both hard and soft incarnations

> Budding synthesists had few options back in '72. Massive modular synthesisers had been around for a while but were expensive and cumbersome, less suited to the stage than they were to the studio.

EMS' VCS3 was small but unstable, and ARP's 2600 – with its patch cables and separate keyboard – was less immediate than the reigning king of the road, the Minimoog, the only truly portable all-in-one option. Until, that is, the ARP Odyssey. This wedge-shaped wonder was lighter than the Minimoog, yet offered far more bells and whistles with which to craft one's, er, bells and whistles. More than that, the Oddy's dual oscillators gave musicians rock-solid tuning stability, along with a suspiciously familiar-sounding 24dB resonant low-pass filter, high-pass filter, FM, oscillator sync, ring modulation, dual envelope generators (AR and ADSR) and a noise generator that could produce sample and hold effects. Flexible and powerful, the Odyssey's panel was relatively immediate, with colourfully capped sliders providing a supremely tweakable interface.

It was, to be sure, far more capable than Moog's mighty Mini, even if it lacked that beefy third oscillator (the Odyssey's LFO was a dedicated job). Its basses might not have been as burly, but they were sharp, tight and punchy. And if the leads weren't quite as present, they could be far more complex. If it had any drawbacks, it was that it lacked the left-hand controllers – no mod or pitch wheels. Pitchbend was provided by a simple potentiometer, later replaced by ARP's own Proportional Pitch Control (PPC) pad, a bit of pressure-sensitive rubber that seemed to confirm that ARP were simply trying to be... well, not Moog. In addition, the sliders were not exactly the most precise means by which to dial in a sound – and they have aged horribly, becoming scratchy and jumpy.

There were a number of variants of the Odyssey across its eight-year production run. Early models were white, replaced by black and gold models in the mid-period, and finally, black and orange.

The Odyssey was embraced by two generations of musicians: the proggers and rockers of the early 1970s loved them almost as much as the new wavers of the 1980s. Edgar Winter, Tony Banks and Joe Zawinul are but a few of the former, supplanted by Devo, Ultravox and Numan in the latter camp.

Today's would-be Odysseans can avail themselves of a handful of software emulations, one of which – GForce's Oddity – has been hailed by users of the real deal. If that isn't enough, Korg now have a number of different sized hardware versions starting at £549.

TECH SPECS

Year of manufacture
1972-1980
Original sale value
£1250
Current price
£2300-£3300
Number made
Approximately 3000

Three great emulations

GFORCE ODDITY 2
£100

A stunning recreation from the folks behind impOSCar, the Oddity has all of the features of the original, plus modern niceties such as patch storage and recall, preset morphing, and host-syncable LFO. Flying Sliders allow you to grab one or more sliders and throw 'em, recording the results. A brilliant clone embraced by users of the real thing.
gforcesoftware.com

ELEKTROSTUDIO ODSAY
FREE

If you don't have the cash for Oddity (and assuming you're on Windows), you can avail yourself of the SynthEdit-based ODSay, a spiffy Odyssey clone from Elektrostudio. Good sound, the right features and a nice GUI make this one a bargain at twice the price! However, it is only 32-bit so an old PC or bridge is required.
plugins4free.com

KORG ODDYSEI
$29.99

Not only have Korg teamed up with original ARP designers to reproduce the synth hardware, they've transferred some of that expertise over to the iOS platform. Oddysei uses Korg's proprietary CMT (Component Modeling Technology) to reproduce all the squeals and texture of the original, with a beautiful touch workflow.
korg.com

Yamaha CS-80

It may not have been the most popular or beloved of the classic polysynths, but Yamaha's wild and wooly CS-80 was nevertheless a heavyweight champion

> Polyphony was something of a holy grail for the synth makers of the late 70s. Weened on a meagre diet of monosynths for nearly a decade, synthesists longed for a workable way to play polyphonically – that is, with chords. Sure, there were a few string machines, but these were paraphonic, employing octave dividers to produce multiple pitches and then simply running the lot through a single filter and VCA.

For many, Sequential Circuits' Prophet-5 (opposite) was the answer to their polyphonic prayers, with five-voice polyphony and instant recall of user patches. It received a lot of attention in the press and graced many a stage.

Yet Yamaha had been there first. Let loose in 1976, the bulky, garish CS-80 was the antithesis of Sequential's Prophet. A huge Tolex-covered enclosure housed a front panel festooned with brightly-coloured rocker switches and paddle levers that looked as if they'd been pulled from one of the company's home organs. One of our own writers once passed on a CS in a shop thinking that was precisely what it was! This impression was made stronger by the chrome legs that support its 100kg bulk.

A closer look reveals the power lurking beneath, with a trap door concealing Yamaha's answer to patch recall: four nearly-complete miniature copies of the front panel. 22 colourful switches allow access to presets, including an instantly recognisable brass sound.

For the serious synthesist, the CS-80 offered two complete and independent signal paths, each consisting of an oscillator routed into a pair of filters (one low-pass, one high-pass) and ADSR envelopes. You could create two completely different patches, one layered on another.

Thanks to a staggeringly complete set of performance features, even the presets could be tailored. Polyphonic aftertouch responded in a natural, musical way to the player's pressure on the keys. Oh, and the keys were velocity-sensitive to boot. It's a keyboard that has rarely been bettered and proved to be a major selling point to players desiring more than the limited note on/off of other synths.

And then there's the ribbon controller, spanning over half the length of the keyboard, allowing you to, say, touch the felt ribbon near the top and swoop down the whole length of the thing, taking your oscillators' pitch with you.

Mind you, the oscillators might just do that entirely on their own – the CS-80 may be the most notoriously cantankerous synthesiser ever made. It went out of tune when transported, or when the temperature changed – and it changed every time you turned the thing on! Though many famous players hauled 'em out on tour, the wisest CS-80 owner left it safely at home in a temperature-controlled studio. Thankfully, the few virtual incarnations alleviate this most troublesome aspect of the mighty CS.

What does it sound like? Think Vangelis' *Blade Runner* and you've got a pretty good idea. Other users included Eddie Jobson (*Alaska*), Jean-Michel Jarre, Toto (on *Africa* and *Rosanna*), and Ultravox.

TECH SPECS

Year of manufacture
1976-1980
Original sale value
£4950
Current price
£25,000+
Number made
Approximately 2000

Three expressive CS-80 emulations

ARTURIA CS-80V
$149

One of Arturia's earliest emulations, the CS-80V (VST/AU/AAX) has matured into a superb package with plenty of extras to bring more power into play, including a superb modulation matrix that offers 13 sources and a whopping 38 destinations. Chorus, tremolo and delay effects have been added, as has an arpeggiator. A powerhouse performer.
arturia.com

MEMORYMOON ME80
$40

One of the few commercial competitors to Arturia's CS-80V, Memorymoon's ME80 offers all of the features of the original. It was initially built with SynthEdit but has since graduated to full 64-bit native code for both Windows and Mac users. If you happen to own Acoustica's Mixcraft Pro, you already have this beauty in your plugins folder.
memorymoon.com

MA LORD CeEs80
FREE

Reaktor users can get a taste of the CS-80 experience with this early recreation found in the Reaktor User Library. It may not have faux wooden panels or rocker switches, but it does recreate the entire signal path of Yamaha's legendary synth, making it a cinch to create some of the sounds made famous by the real deal.
bit.ly/CeEs80

Sequential Circuits Prophet-5

Polyphony and programmability were virtually unheard of when Dave Smith and co unleashed an instrument that would help define the early 80s

> We computer musicians are positively spoiled for options. Our synths offer effectively unlimited voices and instances, and we enjoy total recall of each and every knob, slider and button. Yet there was a time when monophonic instruments were pretty much all we had, and full programmability of patches was the stuff of dreams. Sure, there were some attempts to offer more – Oberheim's Two, Four and Eight Voice synths had polyphony (assuming you were able to match up the parameter settings of an entire SEM module for each voice), and Yamaha's contemporaneous CS-60 and CS-80 synthesisers were somewhat programmable – but by and large, extremely limited mono instruments were the norm.

Fortunately, American Dave Smith was working on something that could solve both problems, and that instrument would become an unprecedented success. His company was called Sequential Circuits, and the instrument was the Prophet-5. Released in 1978, the Prophet-5 offered five complete voices of true polyphony – not the divide-down paraphonic behaviour of string machines or Moog's Polymoog. No, the Prophet's voices had complete, individual signal paths hiding under its stylish black panel. More than that, the instrument was, indeed, fully programmable. Every knob, switch and setting could be saved and recalled, making it a sure winner with live performers and sessioneers alike.

Racking up massive sales (and seemingly perennially on back-order), the Prophet-5 was *the* synthesiser to own – that is, if you could afford it. Those five voices didn't come cheap, with a sticker price of nearly £3000, but that didn't stop the company from shipping out 8000 of the things, and virtually everyone who was anyone had one: Gary Numan, The Cars' Greg Hawkes, Phil Collins, Vangelis, John Carpenter... The list goes on and on.

Double header

Of course, the luxuries of programmability and polyphony wouldn't have been worth more than a look-in had the thing not sounded good. But that it did – superb, in fact, thanks to dual oscillators, a 24dB resonant filter, an LFO and a wicked poly-mod section that enabled Oscillator B or the filter envelope to be routed to the frequency and/or pulse width of Oscillator A, as well as to the filter itself. That might not sound like a lot, but it gave P-5 owners abilities that were hard to come by outside of modular systems at the time. Add to this the raw power of those five voices in unison mode and you had a sound fit to fill an arena. Even the later (and reputedly 'thinner') Rev 3 models had a sound that could peel the enamel off your back teeth.

Today, our plugins folders are stuffed with instruments that offer as much or more than the dear old Prophet-5, some even directly influenced by its designs. There are, of course, 1:1 emulations (see below) if you want the experience of the real deal and, like the original, they make versatile all-rounders.

Dave Smith's brainchild seemed to hit exactly the right balance between flexibility and friendliness, and it's still an excellent template today. No surprise, then, that Dave, under the Sequential name that he now owns again, has started remaking the Prophet-5 which you can get for around £3000.

TECH SPECS

Years produced
1978-1984
Number produced
Approximately 8000
Original sale value
£2845
Current price
£3800-£4500

Three great emulations

ARTURIA PROPHET-V
€149

The aces of analogue emulation had already cloned Moogs, ARPs and more when they unleashed the Prophet-V. An uncannily accurate imitation of the Prophet-5, it also includes a dead-ringer for Sequential Circuits' later Prophet, the digital Prophet-VS, and even allows elements of the two to be combined. A lovely tribute to Smith's work.
arturia.com

MEMORYMOON MESSIAH
$40

Like Arturia's Prophet-V, Memorymoon's Messiah is much more than an emulation. It looks like a souped-up Prophet-5, sure, but a handful of buttons swap the vintage panel and keyboard for various modern niceties like an arpeggiator, graphic envelopes and advanced LFOs. The oscillators also include enhanced options.
memorymoon.com

ARTURIA IPROPHET
£9.99

Arturia get their second entry on this page with a Prophet app. iProphet includes modern flourishes like a vector screen for mixing parameters, effects and a flexible and detailed modulation matrix area. It could do with AU3 support in the next update, but at less than a tenner for some incredible vintage Prophet sounds, it's a great buy.
arturia.com

Fairlight CMI

A trio of intrepid Australians set out to create a digital synthesiser but ended up with an entirely different instrument – one that changed music forever

> It's impossible to overstate the enormous impact of sampling, and hard to imagine a world without it. At the start of it all, there was the Fairlight CMI. The Fairlight wasn't the first device capable of recording and playing back a digital sample (Publison's popular DHM 89 B2 sampling delay processor hit the streets in 1978, with the Fairlight following in 1979), but it was the first to offer a polyphonic, keyboard-based interface.

In what has become something of a legendary tale, sampling was, in fact, only added to the Fairlight's repertoire at the last moment. Initially, it was intended as an eight-voice digital synth with customisable waveforms that could be drawn on a CRT screen with a futuristic-looking light-pen. Designed by Peter Vogel and Kim Ryrie, the Fairlight used digital technology licensed from Creative Strategies' Tony Furse, who'd spent years designing a digital synthesiser for the Canberra School of Music. Furse's synth was the Qasar M8, a massive, hand-wired black box measuring four feet across and a foot-and-a-half in height, and stuffed with 20 8" x 8" circuit boards plus a fan to keep its 64KB of RAM cool.

Though Fairlight was founded in 1975, it would take years for Ryrie and Vogel to get their 'Computer Musical Instrument' to market. They'd already taken pre-orders before they realised that a last minute circuit re-jig would allow for rudimentary sampling. This in turn prompted a complete overhaul of the whole thing, this time focusing on the instrument's new 8-bit sampling capability.

The now-iconic multicomponent Fairlight CMI system finally saw the light of day at the end of 1979, just in time for the technology-obsessed 80s. It was the perfect match for the decade to come, with its sleek ivory cabinetry, rakishly-angled CRT terminal and the ever-present light-pen.

However, such bleeding-edge tech came at a cost. Fairlight systems started at $25,000 with some configurations costing as much as $175k! Needless to say, only hitmakers could afford the things, ensuring that the Fairlight's distinctive sound would be imprinted on the popular music of the day. Users such as Peter Gabriel, Kate Bush, Frankie Goes to Hollywood, Jan Hammer, The Cars, David Bowie and Herbie Hancock exploited the instrument's then-novel sampled sounds as well as its real-time 'Page R' sequencer.

The rest of us could only dream of sampling until the price came down, which it finally did thanks to other manufacturers, eager to capitalise on the Fairlight's Brave New Sound.

Most people carry more powerful computers in their pockets than the boys at Fairlight could ever have dreamed of – yet as we gaze out over our desktop DAW with its attached QWERTY keyboard and MIDI controller, we can't help but chuckle at its vague resemblance to the sampler that started it all.

TECH SPECS

Year of manufacture
1979-1988

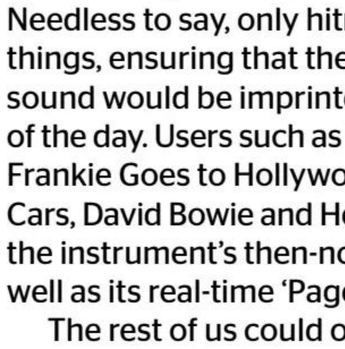
Original sale value
$25,000+

Current price
New, £14,500;
Original, $6,000+

Three ways to get a Fairlight copy

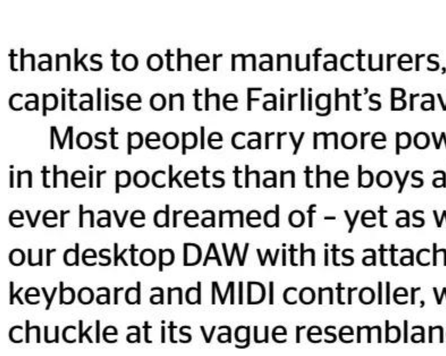
PETER VOGEL INSTRUMENTS CMI
$50

Everything old is new again and you can, as it happens, (possibly) buy an actual new Fairlight CMI from Peter Vogel's new company for the princely sum of just under £14,500. If you don't have that lying around, you can grab this version for iOS. It features a recreation of the Page R sequencer and the entire Fairlight CMI IIX sound library (over 500 "voices").
petervogelinstruments.com



UVI DARKLIGHT IIX
$74

UVI have recreated the Fairlight as a software sampler for the modern desktop DAW, providing a whopping 2.34 GB library of samples that can be played through one of three virtual instruments bearing the familiar Fairlight colour scheme. Synthesis and drum/phrase sequencing are included, as are modelled filters, LFOs, envelopes and effects.
uvi.net



ARTURIA CMI V
€149

Classic keyboard? Then you can bet your bottom Euro that Arturia will have produced a fabulous emulation of it. And sure enough, with a recent V Collection update, the Grenoble-based company released this cracking emulation of the original Fairlight that includes presets and many workstation and synth flourishes.
arturia.com

Roland Jupiter-8

A lumbering behemoth, Roland's answer to the Prophet-5 became a classic in its own right, helping to define the sound of the 80s

TECH SPECS

Year of manufacture
1981-1984
Original sale value
£3999
Current price
£10000+
Number made
approx. 2000

> There's no doubting Roland's place in the history of Electronic Music. Just their TB-303 Bassline synth alone – discussed elsewhere in this book – launched dance music (as helped by the company's TR-808 and 909 drum machines), and we've included other synth models from the mighty Japanese manufacturer in this roundup. However, the prize for 'best Roland synth' must surely go to their Jupiter-8.

Fortunately, with all Roland classic gear, you can now get a flavour of it by way of the company's Roland Cloud platform, which is just as well, as buying the real thing secondhand is now becoming an expensive pastime. (Roland's Cloud is a subscription service, for which you get many emulations of the company's synths and drum machines as software plugins, and you can now also buy each one individually.)

The Jupiter-8 is a synth that is now seen as one of Roland's crowning achievements. Though relatively few units were sold at the time it was produced in the early eighties, the JP-8 has since come to exemplify the pinnacle of polyphonic synth perfection.

Roland's first volley in the war of polyphony was launched in 1978. Dubbed the Jupiter-4, it was relatively limited compared to the Sequential Circuits and Oberheims leading the charge. Though it cost far less than those instruments, it was quite expensive for a four-voice, single-oscillator instrument, and sales were less than stellar.

It would take Roland three years to offer musicians a truly viable alternative to the likes of the Prophet-5. With eight dual-oscillator voices and sounds that could be split and layered across the keyboard, the Jupiter-8 had the voice count of a fully loaded Oberheim OB-Xa and was clearly positioned to compete with the Americans.

The JP-8's architecture was not unlike that of its Yankee cousins, with dual oscillators offering triangle, pulse, square, and sawtooth waveforms (and noise for oscillator 2), plus an LFO, a resonant low-pass filter (that, like the one on the OB-Xa, could be switched between 12 and 24dB) and a pair of four-stage envelope generators. As Roland often did, they stuck a non-resonant high-pass filter into the works for good measure.

64 preset slots and eight combination slots made the Jupiter-8 an ideal tour companion (even if the poor tuning stability of the earliest models did not), and many a big name hauled the beast to stage and studio. Devout users included Greg Hawkes of the Cars, Tangerine Dream (natch!), Bryan Ferry, Thomas Dolby, Rush, Barry Andrews (Shriekback), and Ron Mael of Sparks. Michael Boddicker slathered JP-8 textures all over Michael Jackson's *Thriller*.

The sound of the Jupiter-8 was the epitome of 'analogue mojo', and it's nigh on impossible to precisely reproduce. This accounts somewhat for the insane prices commanded by secondhand units. Just as they did 30 years ago, those who want a bit of Roland magic for less money often make do with one of Roland's many follow-ups and spin-offs from the Jupiter line. The rest of us can look to samples and the many virtual polysynths (below) inspired by the mighty Jovian Giant or opt, as we said earlier, for a flight around the Roland Cloud.

Three plugin Jupiters

ROLAND CLOUD
$30/MONTH

Roland have attempted to bottle the essence of the Jupiter-8 a few times – ok, many times – over the years, always tied to a hardware interface. Their most recent recreation comes in the form of a VST/AU plugin available through their Roland Cloud subscription service and integrates with – but does not require – their System-8 Plug-out hardware.

rolandcloud.com

ARTURIA JUP-8V
$149

As with previous Arturia clones, the pedigree of this Jupiter-8 emulation is now being thinly disguised. Don't let the truncated name and absence of Roland's logo (or indeed any mention of the Japanese company) fool you – this cross-platform plugin has all of the features that made the Jupiter-8 a pleasure to patch and play.

arturia.com

GTG K1 POLYSYNTH
FREE

With such a rich heritage, it's no surprise that Roland are quite pernickety when it comes to protecting their intellectual property, so few developers bother to create obvious Jupiter-8 clones. Still, there are a few plugins that have clearly been inspired by the JP-8, and this little Windows gem is one of them. Added delay and chorus beef up the sound.

vst4free.com

Roland SH-101

It may have been one of the last of the original monosynths, but this quirky analogue instrument gave competing digital synths a run for their money

> The year was 1982. New Wave was overplayed and the MTV era of neon and hairspray had officially begun. Synthesisers were hip if not huge, and a handful of forward-thinking manufacturers were cobbling together a new communication protocol called MIDI. While most synth makers were desperately trying to bring the price of polyphony down to earth, Roland put out what could (and should) have become the de-facto electronic 'axe' for the music video star. Sadly, Yamaha had other ideas, and the DX7 won that battle (see opposite).

Nevertheless, Roland's SH-101 seemed tailor-made for the camera-conscious musician of the 80s. Decked out in red, grey or blue finery and optionally equipped with a handgrip and shoulder strap, the SH-101 could be battery-powered for maximum manoeuvrability. Better still, the thing cost a mere £249 – almost unbelievably affordable compared to the luxurious digital instruments that had taken over the airwaves. In all honesty, it probably didn't matter what the 101 sounded like – at that price, it was destined to be snapped up by any wannabe new wave performer.

Fortunately, it sounded incredible, which was surprising given its meagre feature set. Sporting only a single oscillator bolstered by a sub-oscillator, one of the highlights was Roland's piercing yet smooth low-pass filter. Also notable, the user was not restricted to selecting a single oscillator waveform, as a mixer section enabled waveform amounts to be dialed in via sliders. A noise generator was also included.

Modulation was rudimentary but well-considered. A single ADSR envelope generator was shared by the filter and VCA, while the LFO offered a choice of sine, square, noise and random waveforms that could be used to modulate the VCA, filter, pitch and pulse width. Annoyingly, though, the LFO's rate slider also determined the speed of the onboard arpeggiator/sequencer.

LFO linkage aside, the sequencer was among the SH-101's best features. Simple step-entry programming of notes from the keyboard and the ability to transpose the sequence via the octave buttons or the keyboard itself made it a blast to play. It could even be clocked from external triggers. Very nice.

The sound of this diminutive dynamo was pure Roland, and when the 90s analogue synth revival kicked in, it became a staple fixture in the studios of countless dance producers. The basses were snappy and razor-sharp, the leads squelchy and expressive – especially if you dared to use that hand-grip with its built-in modulation controls.

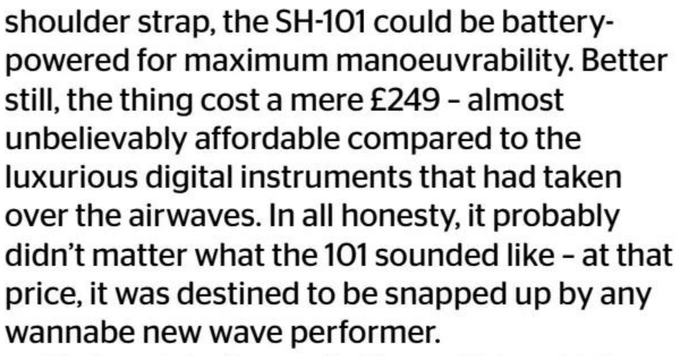
Though affordable in its day, secondhand prices have, of course, gone through the roof. Thankfully, there are plenty of software options if you must have that sound – and it is very much a sound you should want, being warm, punchy and palpably 'analogue'. There's also its ease-of-use and logical parameter selection to consider, making it an ideal and rewarding instrument on which to learn synthesis from the ground up. It's very difficult to make it sound bad.

Some inexpensive synths were brilliant for the price. The Roland SH-101 was 'brilliant', period. Never a rock star's instrument like the Minimoog or Prophet-5, the 101 was a synthesiser for the rest of us, and a damned fine one, too.

TECH SPECS

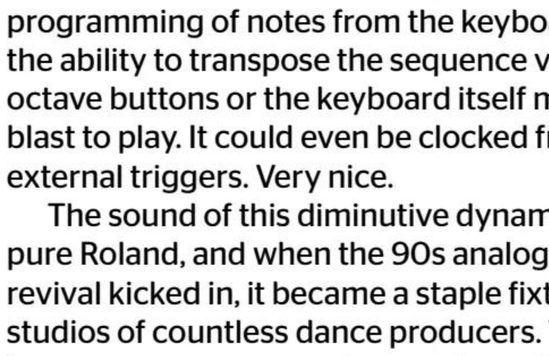
Year of manufacture
1982-1984
Original sale value
£249
Current price
£900-£1200
Number made
Approximately 50,000

Three great emulations



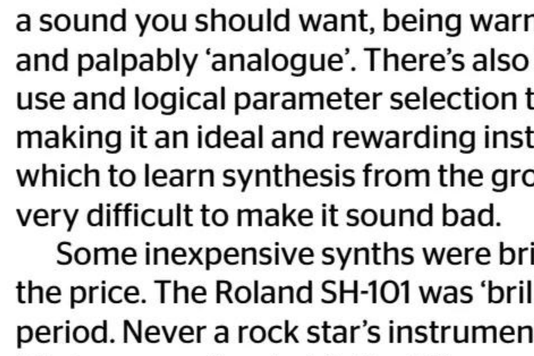
TOGU AUDIO LINE TAL-BASSLINE-101 €60

TAL have made a mission of knocking out exquisitely-crafted emulations of famous Roland synths, and TAL-BassLine-101 is their best yet (and do also try the free version). Featuring delay filtering and a nearly spot-on recreation of the interface, it adds a much more sophisticated sequencer, polyphony, velocity sensitivity, MIDI learn and more.
tal-software.com



D16 GROUP LUSH-101 €149

If you ever wanted more from your SH-101, then D16's LuSH-101 could be the synthesiser of your dreams. While the familiar interface of the original is indeed in place, it's surrounded by additional features like a second LFO, dual envelopes, layering, and even a high-pass filter. There's also a modulation matrix, layer mixer and effects.
d16.pl



ROLAND CLOUD $30/MONTH

We've already seen how well Roland have emulated their Jupiter-8 for their Cloud platform, and the great news is that the SH-101 is up and away there too. Featuring the same kind of component emulation, this one is so good that it will have you virtually strapping it on just like your favourite keys players would have done back in the 80s.
rolandcloud.com

Yamaha DX7

38 years ago, Japanese giant Yamaha released something that changed the way synthesisers were built, programmed, played and sold

TECH SPECS

Years produced
1983-1987

Number produced
160,000 approx.

Original sale value
£1549

Current price
£200-£400

> To understand exactly how profound was the effect of Yamaha's blockbuster DX7 synthesiser, one has only to consider the numbers. The DX7 was released in 1983, just one year after Moog's venerable Minimoog went out of production. The Mini had sold under 14,000 units in just over a decade, but by the time the DX7 was discontinued in 1987, it had racked up approximately 160,000. And that's not counting the sales of the numerous cut-down versions and spinoffs that formed Yamaha's professional synthesiser catalogue from the 1980s onwards.

Why was the DX7 such a resounding success? There are many reasons, but for one, it was revolutionary in the truest sense. That word holds little weight nowadays, so often has it been abused by marketing departments, yet the DX7 was exactly that. While other manufacturers looked for ways to cram eight voices of polyphony into their synth's circuitry, Yamaha managed a full 16. Oh, and those voices were velocity-sensitive, too. Plus, there was this set of funny little 'MIDI' jacks 'round back that allowed it to communicate with a few other likewise-endowed instruments.

And then there was that sound. Eventually considered passé in the face of sample-playback technology, Yamaha's take on digital FM synthesis sounded like nothing before it – certainly not the tired old analogue waveforms to which synthesists had been limited for over a decade. Crystalline electric pianos, bells and crisp tuned percussion alongside spiky, unashamedly digital basses – there was nothing warm or indistinct about the DX, and it was just what musicians were looking for. It didn't hurt that it cost under $2000 when other big names like the Roland Jupiter-8 and Oberheim OB-Xa were selling for over twice that.

The demand was ravenous, and Yamaha duly pumped 'em out in droves. The DX7 was everywhere you looked (or listened) in the mid-80s. Naturally, Yamaha milked the tech for all it was worth, releasing scads of variations on the DX7's successful formula and marketing them in avenues that had never occurred to most synthesiser manufacturers. They even placed ads in comic books.

Smooth operators

The DX7's variation of FM synthesis left many users scratching their noggins. So new was this idea that it single-handedly gave birth to the third-party preset market. Six sine wave oscillators (or 'operators') were arranged in various preset algorithms, each of which described the way in which the operators modulated one another or themselves. Time and level envelopes, LFOs, keyboard scaling, velocity and other mod sources affected the interaction of the oscillators to produce various timbres. Still, it was new and difficult for analogue-accustomed synth jockeys, and it didn't help that it was all programmed via a single data slider and diminutive LCD.

Today, musicians have become more obsessed than ever with analogue sounds, yet the DX-style digital timbres have become embraced by those looking to add a distinctive flavour to spice things up.

You can buy a good new hardware option like a reface DX (£300) or opt for software (below).

Three great emulations

NATIVE INSTRUMENTS FM8
£59

The follow-up to FM7, this one combines a near spot-on emulation of the original DX7 with some fancy modern goodies like multistage envelopes. It also dispenses with Yamaha's preset algorithms, allowing the user to patch the operators in any manner they see fit. And as with FM7, you can even import actual DX7 patches.
native-instruments.com

DX7 V
€149

By now you shouldn't be surprised that Arturia have an emulation of this classic synth available either individually, or as part of their (much better value) V Collection. Importantly, though, Arturia say that "we've streamlined the main interface of the DX7 V to make it much simpler to use and understand", which is a huge bonus as the original was, er, not!
arturia.com

DEXED
£FREE

Dexed is not so much a direct emulation of a Yamaha DX7 but about as good an emulator of DX synthesis as you'll get for free. This FM beauty lays all those FM synthesis controls out for you and makes the process a lot simpler than it should be. And as the original was only really understood by Brian Eno, that's good news all round.
asb2m10.github.io/dexed/

Roland Juno-106

A dead simple architecture, thick chorus effect and a relatively comprehensive MIDI implementation turned this bargain-basement beastie into a cult classic

> It's easy to understand why some instruments have achieved legendary stature. Sequential Circuits' Prophet-5, for example, offered innovative features like polyphony and programmability in a classy package, and even a cursory play on a Minimoog leaves little doubt that it was a performer's dream machine. Why, though, has Roland's Juno-106 entered the synth pantheon? Surely not because it was in any way a comprehensive synthesiser, offering as it did only a single DCO per each of its six voices, an all-too-familiar (if satisfyingly squelchy) 24dB filter and a single four-stage envelope generator shared by filter and amplitude circuits. And the LFO? A laughable affair with a single waveshape. Performance features were similarly anaemic – no velocity functions or aftertouch here, just Roland's favoured horizontally-aligned 'bender' and mod wheel plus a portamento knob.

It's a pretty generic list of specifications, not dissimilar to the many inexpensive polysynths that cropped up in the wake of the Prophet-5. So why the hubbub surrounding the 106? Certainly, much credit could be given to the sound of the machine. The DCO was joined by a sub oscillator that could add a bit of oomph, and the available pulse and the DCO's sawtooth waveforms could be used simultaneously to create interesting hybrids of the two. Roland's dependable four-pole resonant low-pass filter was joined by a simple high-pass, adding timbral variety. Then, too, there was that now-famous Roland chorus circuit, an analogue bucket-brigade design resulting in a thick swirl – the perfect companion to the Juno's noise generator.

Reasonable enough, to be sure, but do such niceties justify the instrument's sustained popularity? Possibly. As any 106 owner will tell you, this is an instrument on which it's easy to learn the basics of synthesis. More importantly, its solid, stable sound provides an encouraging impetus to dig in. Parameters' values can be transmitted over MIDI (albeit in SysEx form), and thus recorded into a sequencer or software editor/librarian. The 106's MIDI implementation was partially responsible for the instrument's longevity in the secondhand market.

The Juno-106 enjoyed healthy sales, and it's still numerous enough albeit at silly prices. A 'home' version with built-in speakers was also available in the form of the HS-60 (or Juno-106S in Japan). If you can find one, Roland's multitimbral MKS-7 module provides two and four voice channels with nearly identical architecture to that of the 106, with an added monophonic bass synth and a smattering of samples from Roland's TR-707 drum machine. Out of the box, the MKS-7 is a preset-only affair, but most Juno-106 editors will allow you to edit the sounds to your liking. Another bonus? Well, the MKS-7 versions respond to incoming keyboard velocity.

As you may have guessed, the rudimentary synthesis of the Juno-106 is easily replaced by software variants, of which there are plenty around. Like the hardware from which they take inspiration, such clones are excellent synths on which to learn the ropes.

TECH SPECS

Year of manufacture
1984-1988
Original sale value
£799
Current price
£900-£1200
Number made
unknown

Three emulative 106 alternatives

U-HE DIVA
$179

Urs Heckmann's divine DIVA features a choice of vintage-emulating oscillator, filter and envelope modules that can be mixed and matched as you like. DIVA's DCO module was actually inspired by Roland's later Alpha Juno synth, but this plugin is equally adept at aping any one of the Junos, including the 106.
u-he.com

ROLAND CLOUD
$30/MONTH

You'll have got to know the Arturia 'score' by now –they've recreated most synths in software –and the Roland score is that you can get most of their classics as plugins too. Subscribe to the Roland Cloud for this beauty (or buy it individually) and you'll get a cracking 106 emulation with 64 presets, eight notes of polyphony and effects.
rolandcloud.com

TAL-U-NO-LX
$60

Though not specifically cloned from a Juno-106, TAL-U-NO-LX was based on the 106's immediate predecessor, the Juno-60, which shared a nearly identical feature set with the 106. In fact, with its switches for saw and pulse waveforms and dual chorus options, TAL-U-NO-LX is closer to the 106 than many that claim to be direct copies.
tal-software.com

Korg M1

One of the most successful synths of all time, this sample-based workstation changed the music-making world

© Image courtesy of perfectcircuitaudio.com

> The year is 1988, and the electronic music industry is at a turning point. Knob-laden analogue synthesisers have faded into memory, and the sample-based wavetable synthesis so beautifully presented by PPG is about to be whitewashed for the masses in the form of the soon-to-be-ubiquitous ROMpler. Roland's entry for 1987, the D-50, combined sampled attack transients with sustained synthesised waveforms, and slathered the lot in a gauzy haze of reverb. It was a mighty success, with the instrument seeming to be on perpetual back-order.

But the D-50 was only the start. Korg, too, had dabbled in sample-based synthesis back in 1985 with their DW-6000 and DW-8000 units, both of which contained a handful of single-cycle sampled waveforms that were pumped through filters, envelopes and even – on the flagship model – a built-in digital delay. With the D-50 selling like hot cakes, it was only natural that Korg would up the ante by tapping once again into sample playback technology.

The result was the M1, which did nearly everything the D-50 did and more, with class, sophistication and refinement. Where the D-50 relied on sampled attacks and novel loops, the M1 offered up a then-burly 4MB of meticulously multisampled real-world instruments that actually made it sound like you were playing the real thing. Like the D-50, the M1 also boasted a full range of effects – and even multieffects – that could be used by its two built-in processors.

There were two inclusions that were crucial to the astonishing success of the M1. The first was a complete and sophisticated eight-track sequencer (the M1 was eight-way multitimbral) that allowed users to cobble together complete arrangements via a familiar pattern/song paradigm. It was friendly and powerful, that power being reinforced by the inclusion of some excellent sampled drum sounds. The M1 was, truly, a musician's workstation.

Users looking to create their own sounds could combine a pair of oscillators (no sync or cross-modulation, alas) and shuttle them through a non-resonant filter, modulating them with envelopes, LFO, keyboard, pedal and joystick. This simple pathway allowed the original samples to shine through.

Those who didn't want to do too much back-end tweaking could avail themselves of a veritable industry of support that grew up around the M1. Third-party patches and add-ons were common currency even into the 1990s. By that time, the M1 had become the biggest-selling synth ever produced, that popularity made evident by its instantly recognisable sounds popping up on radio and TV, and in the cinema. The M1's Pole, Magic Organ and Universe patches have become (perhaps overly) familiar, and its slap bass will resonate forever thanks to Jonathan Wolff's *Seinfeld* theme. And then there's that iconic piano sound – still popular today with dance music producers.

Today, the M1 continues to sell in virtual form from Korg themselves. However, its spirit also lives on in every hardware workstation and software ROMpler on the market.

TECH SPECS

Year of manufacture
1988-1995
Original sale value
£1499
Current price
£350-£500
Number made
250,000

Three M1 copycats

KORG LEGACY COLLECTION M1
$99

Containing all the sounds of the M1 and all 19 of Korg's optional add-on cards, the Legacy Collection M1 provides more than 3000 preset sounds in all. Coming in standalone, VST, AU and RTAS formats, it also adds filter resonance. The effects are ramped up, too, with dual dedicated effects processors available for all eight multitimbral parts.
korg.com

KORG iM1
£29

A different beast to the desktop version, Korg's iM1 for iPad offers the additional after-market cards as in-app purchases (for a total of over 3300 sounds), but adds a keen KAOSS pad controller in addition to filter resonance and beefed up effects. The touchy-feely interface answers any and all complaints about the original's lack of physical controls.
korg.com

SONIC CAT LUXONIX RAVITY
$39

A conscious attempt to offer a virtual equivalent to the M1 and all of the hardware ROMplers that followed it, the Windows-only Ravity and its big brother, Purity, provide a collection of bread and butter sounds, along with neat electronic timbres and percussion in a trim, easy-to-use package. It's a bit dated, but still useful. Just like the M1, then!
sonic-cat.com

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